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Risk Assessment Methodology for Software Supportability (RAMSS) User's Handbook

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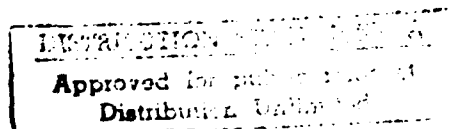SELECTED
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RISK ASSESSMENT METHODOLOGY FOR
SOFTWARE SUPPORTABILITY (RAMSS)
USER'S HANDBOOK

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>The Risk Assessment Methodology for Software Supportability (RAMSS) was developed for the Air Force Operational Test and Evaluation Center (AFOTEC) to provide decision makers with information from which the risk to the Air Force of supporting a software system can be derived. The purpose of this User's Handbook is: 1) to document the procedures necessary to apply automated and manual tools to accomplish a high level risk assessment of a software system's supportability (in accordance with the RAMSS), and 2) to document procedures necessary to access, update, and modify the historical data base of software maintenance data.

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Item 11 (cont'd): Supportability (RAMSS): User's Handbook

FOREWORD

a. This technical report, BDM/A-1270-TR, is submitted by the BDM Corporation, 1801 Randolph Road SE, Albuquerque, New Mexico 87106 to the Air Fore Operational Test and Evaluation Center, Kirtland Air Force Base, Albuquerque, New Mexico 87117-7001. This submission is in compliance with the requirements of paragraph 7.1 of Subtask Statement 412/01, titled "Software Supportability Risk Assessment: Pilot Application."

b. This report is the result of effort by Mr. Walter Huebner, Jr. (Task Leader), Dr. David Peercy (Technical Leader), Mr. M. Donan Estill, Jr. and Ms. Kelley L. Shaw of The BDM Corporation. The primary Subtask Statement Project Officer is Capt. Eric H. Tomlin (AFOTEC/LG5T); the alternate Subtask Statement Project Officer is Maj. Gary R. Horlbeck (AFOTEC/LG5T).

Reviewed and approved by:

Walter F. Huebner
Program Manager

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SECTION I

INTRODUCTION

1.1 PURPOSE OF USER'S HANDBOOK.

The purpose of this user's handbook is to:

(1) Document procedures necessary to apply automated and manual analysis tools to accomplish a high level risk assessment of a software system's supportability in accordance with the Risk Assessment Methodology for Software Supportability (RAMSS) in references 1.4.2 - 1.4.7;

(2) Document procedures necessary to access, update, and modify the historical data base of evaluation and maintenance release data required by the RAMSS.

1.2 OBJECTIVE OF RAMSS.

The objective of the RAMSS is to provide information from which the risk to the Air Force of supporting a software system can be derived. This information is organized so that specific high level risk drivers can be identified for possible trade-off analyses. This information is derived from evaluation data which AFOTEC or AFOTEC-designated personnel collect as part of the current software supportability evaluation process.

1.3 GENERAL ORGANIZATION OF THE HANDBOOK.

a. This handbook is organized around two primary functions:

(1) Assessing a software system's supportability risk;

(2) Updating the historical data base(s).

b. An overview of the procedures and the automated support system tools which assist you in accomplishing these functions is presented in section 2. The functional features, hardware and software support environment, data bases and other files, performance considerations, and the primary user responsibilities and procedures are briefly discussed.

c. The detailed procedures for assessing software supportability risk are presented in section 3. The procedural steps include building the user/supporter (using command/supporting command) baseline estimate, entering evaluation scores, performing necessary analysis, and generating the risk assessment reports. In addition, some analysis considerations with which you should be concerned are discussed.

d. The detailed procedures for updating evaluation analysis data and maintenance release data are presented in section 4. Basic entry/update of the data base values from menu selection is described for all data bases. The primary procedures to update BMDP analysis data involve generating new evaluation data, risk regression coefficients, and new maintenance release data profiles. In addition, some analysis considerations with which you should be concerned are discussed.

e. The RAMSS reports provide you the results of the software supportability risk assessment. There are dBASE III and BMDP RAMSS printed reports. In addition, you can develop custom dBASE III and BMDP reports if necessary. The procedures for generating the RAMSS reports are presented in section 5.

f. The procedures necessary to install and operate the RAMSS automated support software on your hardware, archive application data bases and software to floppy disks for backup or version storage, and recover archived application data bases and software are described in section 6. You should be thoroughly familiar with this section.

g. Several appendices provide additional information. A complete
set of example display screens is presented in appendix A. A set of
example dBASE III RAMSS reports is presented in appendix B. A set of
example BMDP RAMSS reports is presented in appendix C. A hierarchy
diagram of the dBASE III programs and BMDP programs which constitute
the RAMSS automated support software is presented in appendix D. A
detailed description of the data base and memory file structures is
presented in appendix E. A glossary is presented in appendix F.
These appendices along with the documentation in the delivered source
code constitute the available software specifications.

1.4 REFERENCES.

The following documents are referenced by this handbook:

(1) 1.4.1 "Software Supportability Risk Assessment: Pilot
Application," Subtask Statement 412 for AFOTEC Contract
F29601-85-C-0058, AFOTEC, Kirtland AFB, NM, October 1985.

(2) 1.4.2 Hoessel, W., W. Huebner, D. Peercy, G. Richardson,
"Software Supportability Risk Assessment in OT&E: Liter-
ature Review, Current Research Review, and Data Base
Assemblage," BDM/A-84-0322-TR (Final), September 1984.

(3) 1.4.3 Huebner, W., D. Peercy, G. Richardson, "Software
Supportability Risk Assessment in OT&E: An Evaluation of
Risk Methodologies," BDM/A-84-0496-TR (Final), August
1984.

(4) 1.4.4 Huebner, W., D. Peercy, G. Richardson, "Software
Supportability Risk Assessment in OT&E: Measures for a
Risk Assessment Model," BDM/A-84-0565-TR (Final),
September 1984.

(5) 1.4.5 Peercy, D., W. Huebner, M. Estill, J. Wu, "Software Supportability Risk Assessment in OT&E: Historical Baselines for Risk Profiles," BDM/A-85-0510-TR (Vols I and II), October 1985.

(6) 1.4.6 Peercy, D., W. Huebner, "Risk Assessment Methodology for Software Supportability (RAMSS): Guidelines for Adapting Software Supportability Evaluations", BDM/ABQ-86-0090-TR, April 1986.

(7) 1.4.7 Peercy, D., W. Huebner, M. Estill, K. Shaw, "Risk Assessment Methodology for Software Supportability (RAMSS): Pilot Evaluation Results and Methodology Refinement," BDM/ABQ-86-0360-TR, April 1986.

(8) 1.4.8 AFOTECP 800-2 Volumes I through 5, Software OT&E Guidelines.

(9) 1.4.9 dBASE III User Manual, Ashton Tate, Culver City, CA, 1984.

(10) 1.4.10 BMDPC: User's Guide to BMDP on the IBM PC, BMDP Statistical Software, Inc., Los Angeles, CA, (no date).

1.5 TERMS AND ABBREVIATIONS.

AF   Air Force
AFB   Air Force Base
AFOTEC   Air Force Operational Test and Evaluation Center
AISF   Avionics Integration Support Facility
ALC   Air Logistics Center
APT   Available Person Time
ASIT   Adaptable Surface Interface Terminal
ASSET   AFOTEC Software Support Evaluation Tool

ATD	Aircrew Training Device
ATE	Automatic Test Equipment
BMDP	BMDP Statistical Software (NOTE: BMDP is a name, not an acronym.)
C-E	Communications-Electronics
CDR	Critical Design Review
CI	Configuration Item
CM	Configuration Management
CMP	Configuration Management Plan
CMS	Configuration Management System
CRISP	Computer Resources Integrated Support Plan
CSCI	Computer Software Configuration Item
DPS	Data Processing System
DT&E	Development Test and Evaluation
DOD	Department of Defense
ECS	Embedded Computer System
EW	Electronic Warfare
HQ/TAC	Headquarters Tactical Air Command
IOC	Initial Operational Capability
IV&V	Independent Verification and Validation
JTIDS	Joint Tactical Information Distribution System
OFP	Operational Flight Program
O/S CMP	Operational/Support Configuration Management Procedures
OSTF	Off-Site Test Facility
OT&E	Operational Test and Evaluation
PDR	Percentage of the Persons Dedicated to the Block Release
PDS	Percentage of the Persons Dedicated to the Software System
PMD	Program Management Directive
PMP	Program Management Plan
PMPC	Person-Months per Change
RA	Risk Assessment
RAMSS	Risk Assessment Methodology for Software Supportability
S/W	Software

SIM	Simulation
SM-ALC	Sacramento ALC
SMCP	System Maintenance Computer Program
SP/USER	Signal Processor User Simulator
SS	Software Supportability
SS	Software Support
SSF	Software Support Facility
SUP	Support Utility
SYS	System
UTIL	Utility
WR-ALC	Warner Robins ALC

II. Overview of System

SECTION II

OVERVIEW OF RAMSS AUTOMATED SUPPORT SYSTEM

2.1 INTRODUCTION.

a. The RAMSS automated support system is a menu-driven tool
designed to execute on IBM-PC/AT or compatible hardware with one
floppy disk, one hard disk, and one dot matrix printer. All appli-
cable support software is written in DOS, dBASE III, or BMDP statis-
tical software control language, and executes under the PC-DOS or
MS-DOS operating system.

b. The interfaces are through console menu selection and data
entry, and output reports generated on the printer. The system is
very simple. The system does not provide a wide variety of "what-if"
analysis or custom reports. Its focus is upon providing a basic
capability to enter evaluation data, receive an assessment of the
associated software's supportability risk through printed reports,
and update the necessary historical data bases.

c. A general introduction to the RAMSS automated support system
and its use in supporting the required procedures to accomplish risk
assessment and historical data update is presented in the following
subsections.   If you are interested in installing or initiating
operation of the system, see section 6.

2.2 RESPONSIBILITIES AND INTERFACES.

a. You have the responsibility to clearly understand the con-
straints, limitations, procedures and general operational require-
ments presented in this handbook. The users' guides for dBASE III
(see reference 1.4.9) and BMDP (see reference 1.4.10) must be under-
stood to the extent the information in those guides is used by this

system. You must understand the hardware manuals and procedures dictated by the specific hardware system upon which this software is installed.   Reasonable cautions, warnings, and possible user or system errors are described in this handbook, but undoubtedly there will be unanticipated situations.

b. You have the responsibility to obtain credible evaluation data for entry to the risk assessment procedure and to correctly enter these data in the form required by this system. The validity of the software supportability risk assessment is based upon valid evaluation and maintenance release data.

c. The only interfaces involve selection of options from a menu screen, entry/update of evaluation data on a screen displaying the appropriate variables, entry/update of historical maintenance release data, and review/analysis of the RAMSS printed reports. You must execute BMDP programs by invoking BMDP command files. In the case of the risk regression equation, you must manually enter the regression coefficients from the printed BMDP report on a dBASE III menu screen. It may also be necessary to manually connect dots on certain printed report plots in order to achieve a more satisfactory graphic. Plots and charts are crudely generated using dBASE III programs. A more satisfactory output could easily be produced using a graphics package.   No graphics package was identified for use, so dBASE III was determined to be adequate at this time for report generation.

2.3 CONFIGURATION OF HARDWARE AND SOFTWARE ENVIRONMENT.

a. The hardware and software environment is illustrated in figure 2-1.

SOFTWARE

APPLICATION SOFTWARE

dBASE III

BMDP/PC

PC-DOS OR MS-DOS

HARDWARE

MONOCHROME DISPLAY

IBM PC/AT CPU OR COMPATIBLE (ie Z200)

FLOPPY DISK

HARD DISK

DOT MATRIX PRINTER
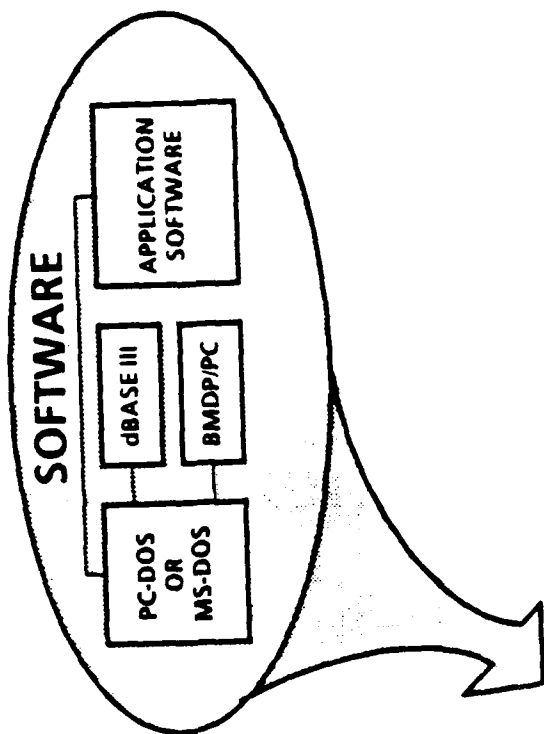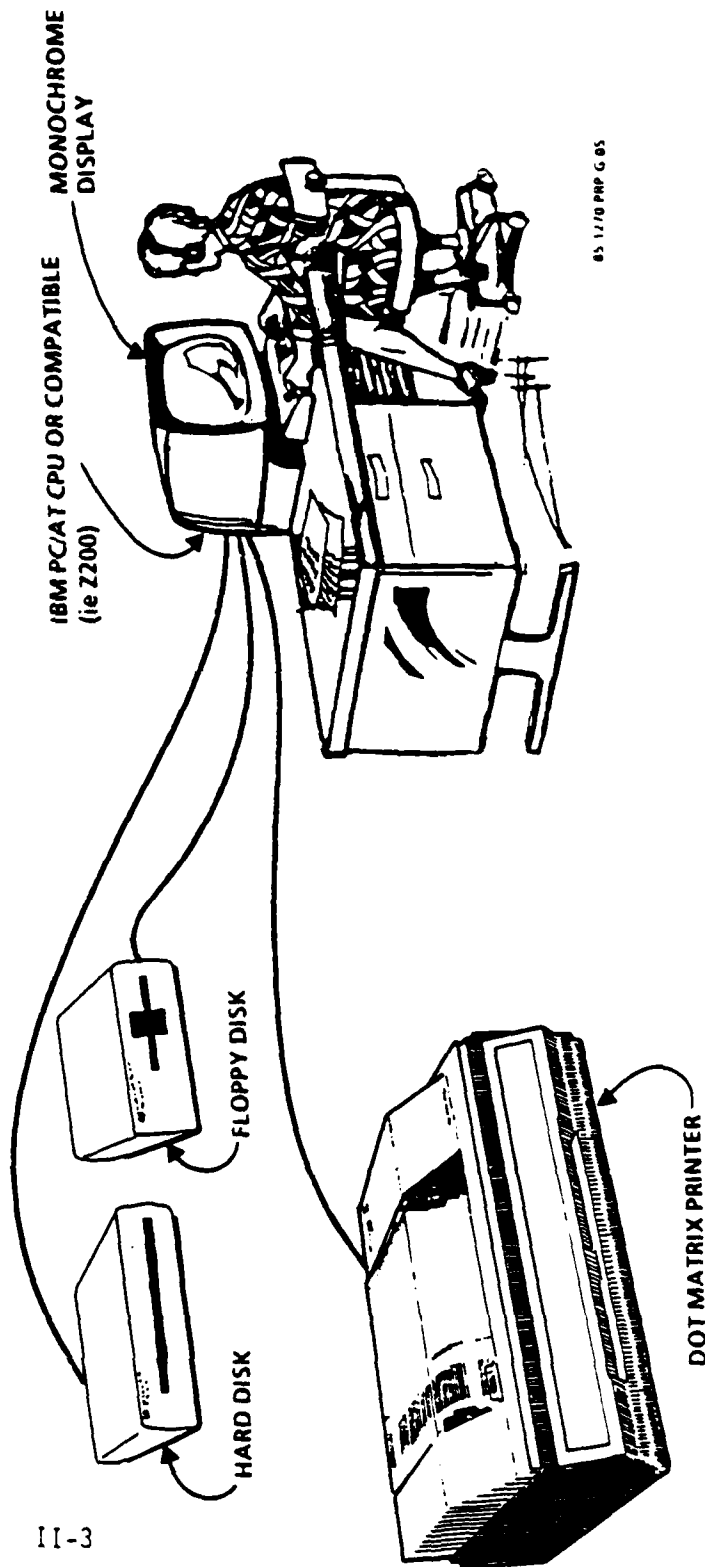
Figure 2-1. RAMSS Automated Support System Hardware and Software Environment

II-3

b. The hardware items consist of:

(1) IBM PC/AT CPU or compatible with 640 kbytes of memory and floating point coprocessor

(2) One floppy disk storage unit (minimum of 356 kbytes)

(3) One hard disk storage unit (minimum of 5 Mbytes)

(4) One monochrome display console (minimum of 80 characters by 24 lines)

(5) One dot matrix printer (minimum of 132 characters).

c. The software items consist of:

(1) PC-DOS or MS-DOS operating system (version 3.10 or later)

(2) dBASE III data base management system (version 1.1 or later)

(3) BMDP/PC statistical software package (1985 version)

(4) Application specific software package.

The application software consists of dBASE III programs, data bases, report files, memory files, index files, and BMDP command files.

2.4 DATA BASES AND FILES.

a. There are several dBASE III data bases and related files, and seven BMDP command files in the application software as illustrated in figure 2-2.
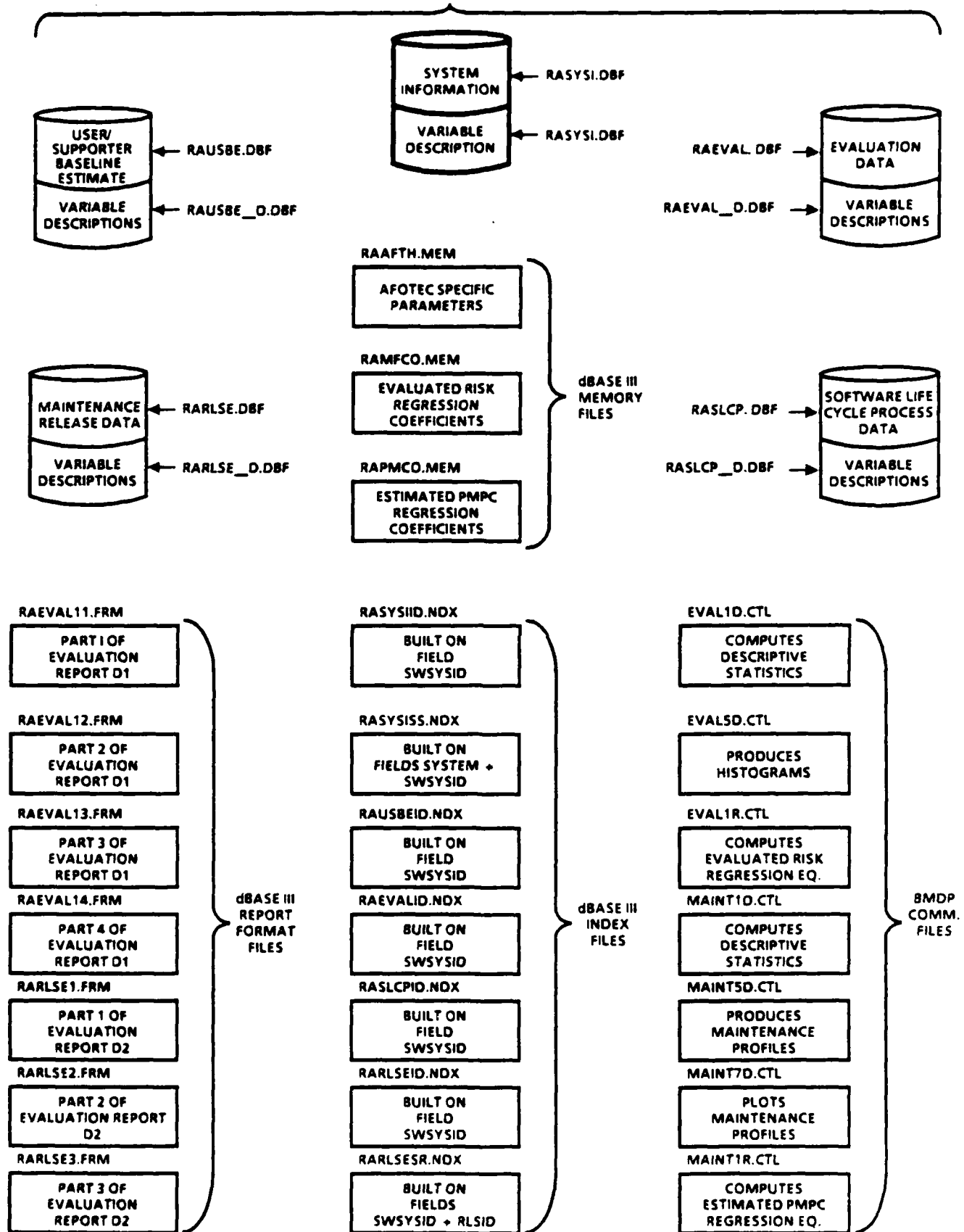
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Figure 2-2. RAMSS Automated Support System Data
Bases and Files

b. The dBASE III data bases include:

    (1) RASYSI.DBF   - System Information

    (2) RASYSI_D.DBF - System Information Variable Descriptions

    (3) RAUSBE.DBF   - User/Supporter Baseline Estimate

    (4) RAUSBE_D.DBF - User/Supporter Baseline Estimate Variable Descriptions.

    (5) RAEVAL.DBF   - Evaluation Data

    (6) RAEVAL_D.DBF - Evaluation Data Variable Descriptions

    (7) RASLCP.DBF   - Evaluation Data for Software Life Cycle Process (SLCP)

    (8) RASLCP_D.DBF - Evaluation Data (SLCP) Variable Descriptions

    (9) RARLSE.DBF   - Maintenance Release Data

   (10) RARLSE_D.DBF - Maintenance Release Data Variable Descriptions

c. The dBASE III memory files include:

    (1) RAAFTH.MEM   - AFOTEC Specific Parameters (e.g., Threshold/Goal)

    (2) RAMFCO.MEM   - Major Factor Regression Coefficients

    (3) RAPMCO.MEM   - Estimated Person Months Per Change Regression Coefficients

d. The dBASE III index files include:

(1) RASYSIID.NDX - Built   from   RASYSI.DBF   on   the   field
                     SWSYSID

(2) RASYSISS.NDX - Built from RASYSI.DBF on the combination
                     of fields SYSTEM and SWSYSTEM

(3) RAUSBEID.NDX - Built   from   RAUSBE.DBF   on   the   field
                     SWSYSID

(4) RAEVALID.NDX - Built   from   RAEVAL.DBF   on   the   field
                     SWSYSID

(5) RASLCPID.NDX - Built   from   RASLCP.DBF   on   the   field
                     SWSYSID

(6) RARLSEID.NDX - Built   from   RARLSE.DBF   on   the   field
                     SWSYSID

(7) RARLSESR.NDX - Built from RARLSE.DBF on the combination
                     of fields SWSYSID and RLSID.

*Note: The numeric field SWSYSID is converted to a
character string while the index file is being built.
This is necessary when building index files on a combina-
tion of fields.

e. The BMDP command files include:

(1) EVAL1D.CTL   - Reads ASCII evaluation data file, creates
                    SAVE file EVAL.SAV, computes simple des-
                    criptive statistics

(2) EVAL5D.CTL - Produces histograms and cumulative fre-
                   quency plots of supportability factors and
                   risk

(3) EVAL1R.CTL - Computes coefficients for evaluated risk
                   regression equation, plots transformed
                   risk (L(RISK)) values against each of the
                   supportability factors

(4) MAINT1D.CTL - Reads ASCII maintenance data file, creates
                   SAVE file MAINT.SAV, computes simple des-
                   criptive statistics

(5) MAINT5D.CTL - Produces maintenance profiles (histograms
                   of person-months per change) for:

                   - All releases combined

                   - All software types combined

                   - All software types separately

(6) MAINT7D.CTL - Plots maintenance profiles for all soft-
                   ware types side-by-side for comparison

(7) MAINT1R.CTL - Computes coefficients for estimated
                   person-months per change regression equa-
                   tion.

A more complete description and listing of each data base and file
variable is presented in appendix E.

2.5 PERFORMANCE.

Typical performance and size attributes of the application software are given in the next few paragraphs. The term "pp" means printed page.

2.5.1 Inputs.

(1) For each system evaluated:
System Identification Data-5 .variables
User/Supporter Baseline Estimate - 38 variables
Evaluation Scores (Software Product) - 12 variables
Evaluation Scores (Software Support Resources) - 12 variables
Evaluation Scores (Software Life Cycle Process) - 10 variables
(potential of 400 lower level variable scores)

(2) For each system with maintenance data:
System Identification Data - 5 variables
Maintenance Release Data - 26 variables

2.5.2 Outputs.

(1) Risk Assessment Reports:
User/Supporter Baseline Estimate - 1 pp
Evaluation Scores (one software system) - 1 pp or 2 pps
Major Factor Percentile Chart - 2 pps
Major Factor Risk Impact Chart - 1 pp
Maintenance Profile CDF Plot - 3 pps
Software Supportability Risk Assessment Summary - 1 pp

(2) Evaluation Data Base Update Reports:
Table of Evaluation Data (all systems) - 49 systems/pp
BMDP Risk Regression Equation Reports - 20/pps

(3) Maintenance Release Data Base Update Reports:
Table of Maintenance Release Data (all systems) -
48 releases/pp
BMDP Maintenance Profile Reports - 60/pps

2.5.3 Response Time.

a. Typical response time for menu screen interactions is imme-diate. Entry of evaluation or maintenance release data depends

somewhat upon your skills, but typically should take no more than 10 to 30 minutes per evaluation set or maintenance release. The time to perform necessary computations and print the dBASE III evaluation analysis reports (A1-A6) is approximately 10 minutes. It takes approximately 10 minutes to print the table report of evaluation data. The time to print the table report of maintenance release data is approximately 25 minutes. The time to execute the BMDP program to update the evaluated risk regression equation and print out the subsequent reports is approximately 30 minutes. It takes approximately 1 hour to execute the BMDP programs to update the estimated person-months per change regression equation and print the subsequent reports.

b. Specific equipment configurations including CPU and printer may affect the above approximate response time estimates, but not significantly.

2.5.4 Limitations.

a. The only limitations which might be a factor in the future would be the disk space necessary for the evaluation and maintenance release data. It takes approximately 482 bytes of storage to add one software system (includes software system information, user/supporter baseline estimate, and evaluation scores). This increases to 933 bytes if the software life cycle process low level characteristic scores are included. It takes approximately 163 bytes for each maintenance release record that is added. Using the total space available on the specific hard disk unit, you can compute the limitations on the number of evaluations and/or maintenance releases which can be added to the disk.

b. The hard disk should have a minimum of 10 megabytes of available program work space in order to store system software, application software, data bases, and execute the RAMSS programs.

c. There is currently no convenient way to transfer data from a printed BMDP report directly to a file which can then be accessed by dBASE III. This means the evaluated risk regression coefficients plus the estimated person months per change regression coefficients computed by a BMDP program must be manually transferred by the user from the printed BMDP report to dBASE III memory files(via a menu screen entry).

2.5.5 Error Processing.

a. There are several built-in and several embedded error checks in the application programs to aid in the input of data and the consistency of the data base information.

b. Checks built-in to dBASE III include:

(1) Character fields, logical fields, and numeric fields are automatically checked. Illegal (i.e., wrong type) data cannot be entered.

(2) Numerous other built-in checks will depend upon what you are attempting to do. Check the dBASE III user's manual (reference 1.4.9) for more information.

c. Checks built-in to BMDP include:

(1) Data input errors may cause BMDP error messages to be printed. See the BMDP user's guide reference 1.4.10 if such error messages appear in the BMDP printed reports.

d. Checks embedded within the application program include:

(1) Each entry option (e.g., "C" for Continue) is checked to assure a valid value has been entered. If not, the menu is displayed again.

(2) Evaluation data and maintenance release data are generally checked for proper range limits. For example, each evaluation score entered must be between 1.00 and 6.00, and is a real value with two decimal places.

(3) Internal flags are maintained to determine which evaluation and maintenance release data are to be "sent" to BMDP for use in creating the risk regression equation and the maintenance histogram profiles. BMDP performs additional checks for missing and inconsistent data depending upon the input commands in the BMDP command files.

(4) In order to make sure the risk regression coefficients in the dBASE III memory file RAMFCO.MEM are consistent with the current evaluation data, an internal flag is maintained in the RAMFCO.MEM memory file. When there is any change in the status of evaluation data records to be included in the analysis, the flag will be modified to indicate invalid. You will see a warning message on all screens and reports until a new set of regression coefficients has been manually entered into the RAMFCO.MEM memory file (via a screen entry). Likewise, an internal flag is also maintained in the RAPMCO.MEM memory file to make sure the estimated person-month per change coefficients in RAPMCO.MEM are consistent with the current maintenance release data.

2.5.6 Flexibility. There is reasonable flexibility for you to build custom reports of other combinations of data not already output as part of the standard reports. You would need to be familiar with the dBASE III report processor and/or BMDP statistical report capabilities and the structure of the data bases. It is possible to create new command file inputs for the BMDP program and obtain other data analyses not already being reported. Refer to section 5.4, the dBASE III user's manual, and the BMDP user's manual for more details.

2.6 GENERAL DESCRIPTION OF MAJOR PROCESSES.

a. The RAMSS allows you to accomplish four major processes: assessment of software supportability risk; update of the RAMSS data base; generation of RAMSS reports, and system level support such as system installation, data and program backup and retrieval. The risk assessment, data base update, and report generation processes are illustrated at a high level in figure 2-3.

b. For the risk assessment process, enter the user/supporter baseline estimate data and supportability evaluation scores. The output reports include up to 11 dBASE III analysis and data reports and 2 primary BMDP statistical analysis reports. For the update of the analysis data, enter either supportability evaluation data or maintenance release data, execute a dBASE III program to generate ASCII data files, and run a BMDP statistical program to read the ASCII data file and produce an analysis report. The two primary BMDP analysis reports are the risk regression equation update and the maintenance profile update. In the case of the regression equations update, you are required to manually transfer the resulting updated regression coefficients into dBASE III memory files for use in computing the software supportability risk and estimated person-months per change. These processes are described in more detail in sections 3, 4, and 5.

c. The system generation process consists of two parts: procedures for installation of the RAMSS system and application support software on a hard disk; and procedures for normal system start-up, shut-down, and program initiation. There are also some key warnings and references to the dBASE III user's manual (see reference 1.4.9) and the BMDP user's guide (see reference 1.4.10). Procedures for archival (backup) and recovery (retrieval) of RAMSS data and programs between the hard disk and a floppy disk are important in order to protect your data from disk crashes or inadvertent erasure. The system generation, archival, and recovery procedures are described in more detail in section 6.
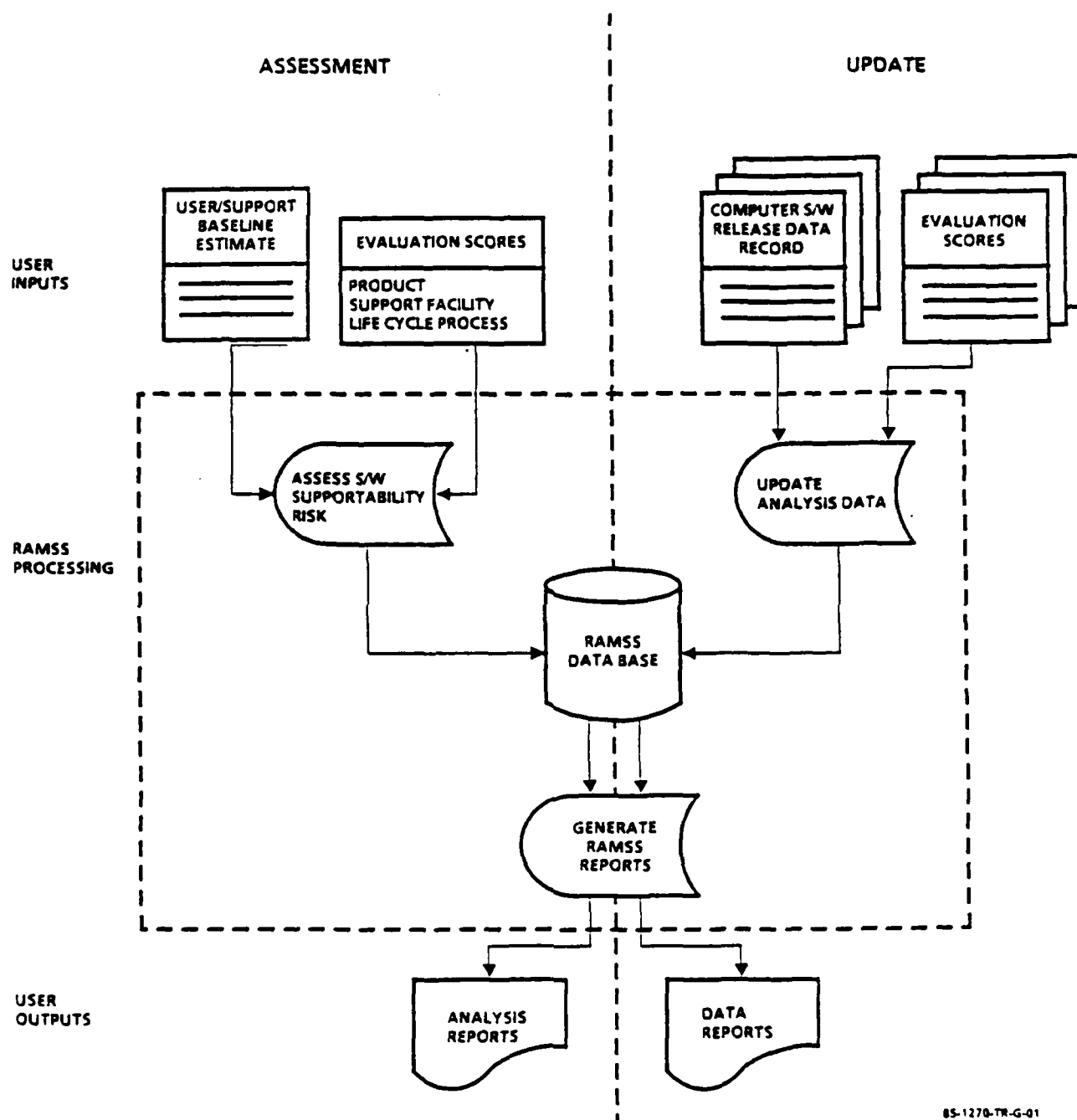
Figure 2-3. Overview of Major Processes of RAMSS: Risk
Assessment and Analysis Data Update

III. Assess Software
Supportability Risk

SECTION III

ASSESS SOFTWARE SUPPORTABILITY RISK

3.1 ASSESS SOFTWARE SUPPORTABILITY RISK.

The process of assessing the risk of supporting a software
system consists of the following steps:

(1) Step 1: Enter software system information data. In
order to reference the software system, enter evaluation
or maintenance data, and in general assess risk, it is
necessary to enter some minimal identification data for
the software system. This information includes system
name, software system name, and software system type
(i.e., ATD, ATE, C-E, EW, OFP, SIM, SUP). The RAMSS
system automatically generates a software identification
number which is subsequently referenced for nearly all
data entry.

(2) Step 2: Build a user/supporter baseline estimate. This
baseline summarizes the general resources and level of
support activity required to maintain the subject soft-
ware system. The creation of such a baseline can be
assisted somewhat by the RAMSS system. The baseline
estimate data are entered into the RAMSS data base for
computation of the estimated supportability risk and
future reference during the software supportability
evaluation.

(3) Step 3: Conduct the software supportability evaluations.
These evaluations are conducted according to the proce-
dures described in reference 1.4.6 and 1.4.8. The
hierarchy of software supportability evaluation elements

is shown in figure 3-1. The following characteristic evaluation scores must be entered in the range from 1.00 to 6.00

a) Documentation: Modularity, Descriptiveness, Consistency, Simplicity, Expandability, Instrumentation

b) Source Listings: Modularity, Descriptiveness, Consistency, Simplicity, Expandability, Instrumentation

c) Personnel: Management, Technical, Support, Contractor

d) Support Systems: Host, Software Bench, Laboratory Integrated Test, Operational Integrated Test, Configuration Management System, Other

e) Facilities: General, Support Systems

f) Project Management: Planning, Organization Structure, Design Methods, Code/Implementation Methods, Test Strategies, Project Interfaces

g) Configuration Management: Identification, Control, Status Accounting, Audit/Review

There will be a total of 34 characteristic evaluation scores, or possibly fewer if some of the characteristics (e.g., Support Systems/other) do not have evaluation scores. The scores for project management and configuration management are for the software life cycle process evaluation. The RAMSS support tool allows entry of lower level characteristic scores and the automatic computation
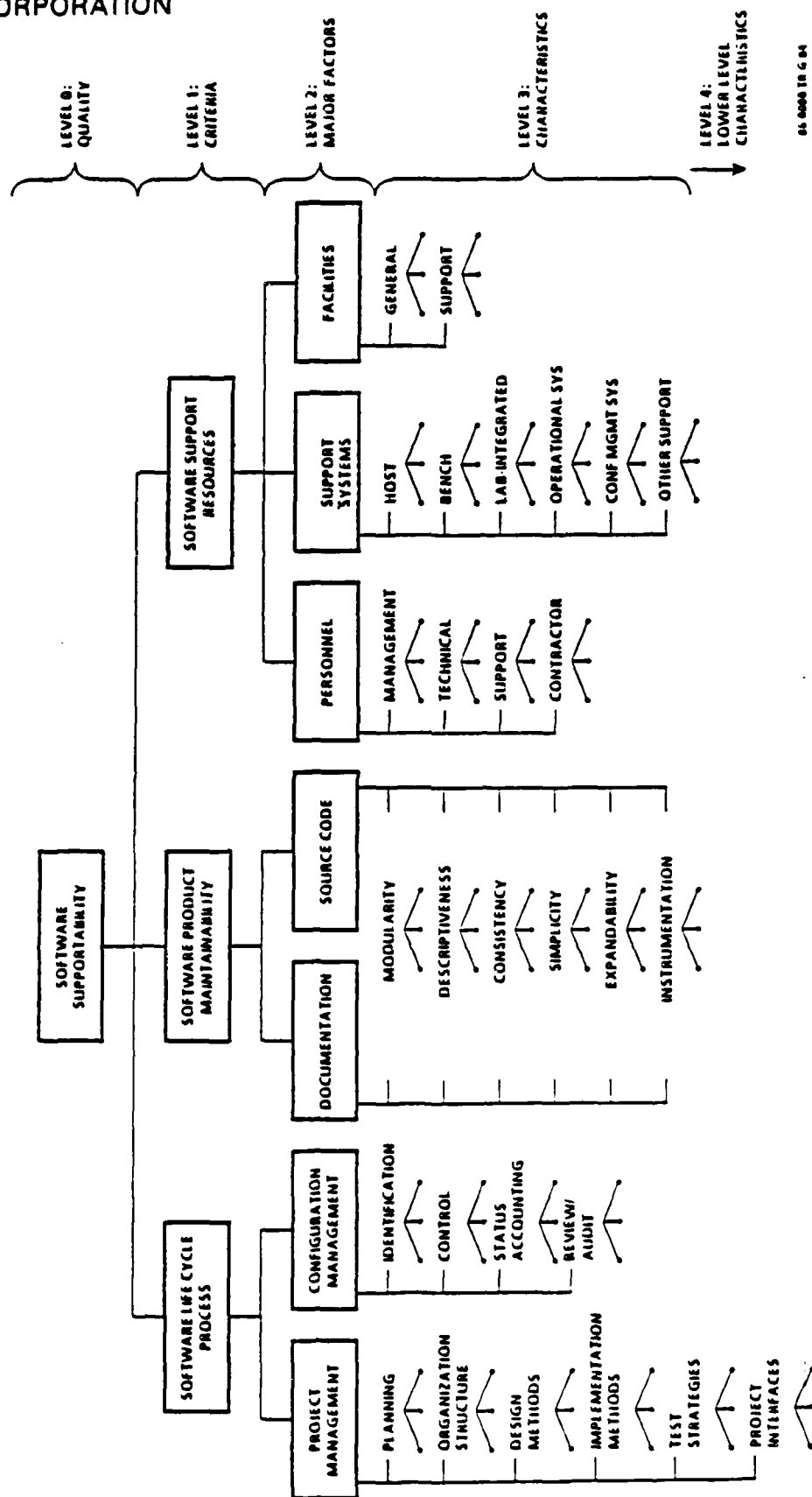
Figure 3-1. Elements of Software Supportability Evaluations

of the ten RAMSS software life cycle process evaluation scores (f and g above).

In addition to the above evaluation scores, an overall assessment score which is called the software supportability confidence must be entered. On the basis of all available evaluation data, software system review information, working group data, and so forth, the software test manager/deputy for software evaluation assesses the confidence that the subject software system can be supported at the level of activity indicated by the user/supporter baseline estimate. This is a real value between 0.00 and 1.00. This value is only used as part of the _future_ risk regression equation update process (see section 4). It is necessary to relate the evaluation scores to the overall supportability confidence in order to integrate the evaluation into the evaluated risk regression equation (see reference 1.4.7).

(4) Step 4: Enter the evaluation scores into the RAMSS data base. You enter the 34 evaluation scores plus the one confidence assessment score into the RAMSS evaluation data base. If appropriate, the software life cycle process low level characteristic (see reference 1.4.6) evaluation scores can be entered instead of the 10 characteristic level scores.

(5) Step 5: Compute necessary hierarchical evaluation scores and associated risk values. This step does not require your direct participation, but is automatically done when the evaluation data are entered.

(6) Step 6: Generate RAMSS analysis and data reports. There are several standard reports which can be printed to

assist you in understanding the computed software supportability risk. These analysis reports include:

a) A1 - User/Supporter Baseline Estimate and Estimated Person Months per Change and Risk

b) A2 - Table of RAMSS Scores for the Complete Evaluation Hierarchy and Evaluated Risk

c) A3 - Chart showing percentile for each major factor score relative to all previous evaluation scores

d) A4 - Chart showing relative risk reduction potential of each major factor upon software supportability risk

e) A5 - Plot of software supportability risk curve with the evaluation's estimated and measured risk values displayed for each block release of the user/ supporter baseline estimate

f) A6 - Summary results of the software system's risk assessment for supportability.

There are also data reports which provide general listings of raw data in the RAMSS date base, and analysis reports generated by BMDP programs. These reports are very valuable for an understanding of the dBASE III analysis reports. The dBASE III data reports include:

a) D1 - List of Evaluation Data

b) D2 - List of Maintenance Release Data

c) D3 - Table of Evaluated Risk Regression Equation Coefficients

d) D4 - Table of Estimated Person Months Per Change Regression Equation Coefficients

e) D5 - Table of AFOTEC Parameters (Threshold/Goal)

The BMDP reports include:

a) B1 - Evaluations: Initial Setup and Analysis

b) B2 - Evaluations: Histograms of Factors and Risk

c) B3 - Evaluations: Risk Regression Analysis

d) B4 - Maintenance: Initial Setup and Analysis

e) B5 - Maintenance Profile: All Releases

f) B6 - Maintenance: Comparison of Software Type Profiles

g) B7 - Maintenance: Regression Analysis of ln(PMPC)

The procedures required to exercise the RAMSS system as part of the above steps are described in the following subsections. When you execute the RAMSS dBASE III program (section 6 describes the process of initiating dBASE III and BMDP programs), the Master Menu screen 1.0 is displayed (see appendix A). The necessary steps to assess the software supportability risk can be accomplished using the master menu options.

3.2 UPDATE EVALUATED SYSTEM INFORMATION DATA.

The first step to risk assessment is to make sure there is an entry in the RAMSS data base for the subject software system, and that the data are accurate. If there is no entry for the software system, then it will be necessary to create a software system entry by selecting option "S" from the Master Menu screen 1.0. The system information data can then be entered. The procedure for updating the system information data is described in section 4.2.

3.3 BUILD USER/SUPPORTER BASELINE ESTIMATE.

a. The second step to risk assessment is to build a user/ supporter baseline estimate. This estimate is used to compute an initial estimate of the supportability risk, and in the conduct of the supportability evaluation.

b. The selection of option "B" from the Master Menu screen 1.0 allows you to enter such an estimate. You have some options to help in the construction of a baseline estimate. These options are:

  (1) Enter data as determined from user and supporter discussions

  (2) Select baseline estimate data from a current maintenance release data entry

  (3) Select baseline estimate data from the average of current maintenance release data of (1) the same type as the subject system or (2) all systems

  (4) Select a baseline estimate entry from among the current baseline estimate entries.

c. You can build the estimate from some combination of the above four options as well. There are a maximum of three block releases for which baseline change data can be estimated (practical limitation only).

d. Data to be entered include the support concept (e.g., number of support personnel, length of release cycle), and the baseline change profile (e.g., counts of changes by type, complexity, priority). The process of building a baseline estimate may evolve over a considerable period of time. The only requirement for risk assessment is that the estimate be in place prior to the conduct of the software supportability evaluation. The detailed description of the procedure for updating user/supporter estimate data is discussed in section 4.3.

3.4 ENTER SUPPORTABILITY EVALUATION SCORES.

a. After the software product, software support facility, and software life cycle process evaluations have been conducted (see references 1.4.6 and 1.4.8), the pertinent scores to the RAMSS must be entered into the RAMSS data base using the Update Evaluation Data procedure. This is accomplished by selecting option "E" from the Master Menu screen 1.0 and following the procedures discussed in section 4.4.

b. You have some options as to the level of detail at which the software life cycle process data are entered. All that is required by the RAMSS is to enter the 10 values for project management and configuration management described in Step 3 of section 3.1. However, the lower level characteristic evaluation scores for the software life cycle process evaluation can be entered and the required evaluation scores computed (as an average of the lower level scores). No weights are applied and missing data are not averaged.

3.5 COMPUTE EVALUATION HIERARCHY AVERAGES.

All levels of the software supportability hierarchy above the characteristic level are automatically computed during entry of the evaluation scores. The usual averaging technique over non-missing values is used. For example, the documentation score is the average of modularity, descriptiveness, consistency, simplicity, expandability, and instrumentation. Each of the major factors described in step 3 of section 3.1 is similarly computed.

3.6 GENERATE RISK ASSESSMENT REPORTS.

a. Risk assessment reports can be generated from dBASE III and from BMDP programs. Step 6 of section 3.1 describes briefly the 11 dBASE III reports and the 7 BMDP reports. The report generation procedure and report content are more fully described in section 5 and appendices B and C. The dBASE III reports are generated by selecting option "G" from the Master Menu screen 1.0 and the subsequent options "A" or "D" from the menu screen 1.7. The BMDP reports are generated by BMDP programs which read ASCII files built by dBASE III programs. The build of the ASCII files is initiated from the menu screen 1.7.3.

b. One critical interface between the RAMSS data base and the BMDP reports must be accomplished manually. Whenever the risk regression equation is updated through execution of a BMDP program, then the risk regression coefficients and the constant term must be taken from the BMDP report and entered into the RAMSS data base. The coefficients are entered into the RAMSS data base (actually a dBASE III memory file) through selection of option "C" on the Master Menu screen 1.0 followed by selecting option "V" on screen 1.5. Likewise, whenever the estimated person-month per change equation is updated through execution of a BMDP program, then the PMPC regression coefficients, the constant term, and the standard deviation must be

taken from the BMDP report and entered into the RAMSS database. These values are entered through the selection of option "C" on the Master Menu Screen 1.0, followed by selecting option "P" on screen 1.5. The detailed procedures for accomplishing these update processes are described in section 4.6.

IV. Update Analysis Data

SECTION IV

UPDATE ANALYSIS DATA

4.1 INTRODUCTION.

a. Updating analysis data primarily consists of the following
functions:

(1) Entering, editing, deleting evaluation scores and system
     identification information.

(2) Computing a new regression equation to predict software
     supportability risk based upon the evaluation scores for
     the major factors: documentation, source listings, per-
     sonnel, support systems, facilities, project management,
     and configuration management.   Such computation is
     required only if it is desirable to integrate one or more
     new evaluations or changes to old evaluations into the
     risk prediction regression equation.

(3) Entering, editing, deleting maintenance release data and
     system identification information.

(4) Computing new maintenance profiles to reflect the addi-
     tion, deletion, or modification of maintenance release
     data.

(5) Modifying values for evaluation score and risk assessment
     thresholds and goals.

This section describes the procedures necessary to accomplish these
functions. These functions are the basis for the process described
in section 3 for assessing the software supportability risk.

b. In order to update any of the analysis data you must first access the menu screen from which the update can be selected. This is accomplished by following the instructions in section 6 for initiating the execution of the dBASE III part of the RAMSS automated support tool. The initial display is a Master Menu which allows the you to select the required update option. In particular, you can enter options to select whether system information data are to be updated; user/supporter baseline estimate data are to be updated; evaluation data and/or maintenance release data are to be updated; risk regression equation coefficients are to be updated; or AFOTEC - specific parameters are to be updated. The update options are shown below. The display screens are described in appendix A.

     (1) S - UPDATE SYSTEM INFORMATION DATA

     (2) B - UPDATE USER/SUPPORTER BASELINE ESTIMATE DATA

     (3) E - UPDATE RAMSS EVALUATION DATA

     (4) M - UPDATE MAINTENANCE RELEASE DATA

     (5) C - UPDATE REGRESSION EQUATION COEFFICIENTS

     (6) A - UPDATE AFOTEC THRESHOLD/GOAL PARAMETERS

Sections 4.2 - 4.7 describe each of these options.

c. While you are in the dBASE III RAMSS System, you may perform functions which cause either >>WARNING #1<< or >>WARNING #2<< to appear on the top line of the screen. Below is a description of what these warnings indicate:

     WARNING #1: Inconsistencies may exist between current evalua-
                       tion scores and the current evaluated risk

regression coefficients. You need to update these coefficients by following the procedure described in section 4.6.2.

This message will appear if you (1) modify or delete RAMSS evaluation scores that have been used in computing the current evaluated risk regression coefficients, (2) add or modify software life cycle process scores for a system whose RAMSS evaluation scores have been used in computing the current evaluated risk regression coefficients, (3) delete a record from the system information file (causes all associated data, including evaluation scores to be deleted) of a system whose RAMSS evaluation scores have been used to compute the current evaluated risk regression coefficients, or (4) build an ASCII file of evaluation data.

WARNING #2:   Inconsistencies may exist between current main-
              tenance release data and the current estimated
              person-months per change regression coefficients.
              You need to update these coefficients by follow-
              ing the procedure described in section 4.6.4.

This message will appear if you (1) modify or delete mainten-ance release data that have been used in computing the current estimated person-months per change regression coefficients, (2) delete a record from the system information file (causes all associated data, including maintenance release data to be deleted) of a system whose maintenance release data have been used to compute the current person-months per change regres-sion coefficients, or (3) build an ASCII file of maintenance release data.

4.2 UPDATE SYSTEM INFORMATION DATA.

4.2.1 <u>System Information Data Base Format</u>. A complete format of the system information data base is given in appendix E. The functional data fields include:

     (1) Software system identification number

     (2) Creation date

     (3) System name

     (4) Software system name

     (5) Software system type

     (6) Description (name) of the user (using command)

     (7) Description (name) of the supporter (supporting command/ contractor).

The system information data base is a dBASE III data base named RASYSI.DBF.

4.2.2 <u>Update System Information Data Base</u>.

   a. A flow summary of the procedure for updating system data is shown in appendix A. Option "S" is selected from the Master Menu screen 1.0 if you desire to add, delete, or modify system information. You may enter the update option, return to the previous screen, or exit to the Master Menu.

   b. If a new system entry is to be added, you are presented with a screen of variables to be defined. These variables include:

(1) System Name

(2) Software System Name

(3) Software System Type

(4) User of Software System

(5) Supporter of Software System

(6) Creation Date.

The System and Software System names must be a unique pair. If not, then the entry will not be accepted, and you will be allowed to make a correction to the entry. If the pair is unique, then a new system identification number is automatically generated. At this point, you can choose to save the new record, edit any of the information just entered, or return to the main menu without saving the new record. If you save the record, then screen 1.1 is again displayed for further action.

    c. If a current system entry is to be deleted, then you are requested to enter a valid software system identification number. You can get a list of current numbers and system/software system names if you so desire. Upon entry of a valid identification number, the system information data is displayed along with the creation date and whether any associated data currently exist in the evaluation data base and/or the maintenance release data base. You are cautioned <u>strongly</u> that choosing the option to delete the specified system entry will cause the system information data and any associated user/supporter baseline estimate data, evaluation data, and maintenance release data to be deleted. Also, if the system you are deleting has evaluation scores or maintenance release data that have been used to compute either the current evaluated risk regression

coefficients or the current person-months per change regression coefficients, these coefficients will no longer be valid. See section 4.1c for more details. You are given the option to delete the entry or return to the previous screen without any deletion. When the deletion is complete (if deletion was chosen) menu screen 1.1 again displayed for further action.

d. If a current system entry is to be modified, you are requested to enter a software system identification number. Upon entry of a valid software identification number, a set of system data is displayed, and these data may be edited. However, before it is saved via user option selection, the system and software system name are checked as a pair for uniqueness. If the pair is unique, then the modified system information data will be saved in the system information data base. Otherwise, you will be allowed to make a correction to the entry. After the data have been saved, then menu screen 1.1 is again displayed for further action.

e. It should be emphasized that no risk assessment or data update can be done on a software system unless the system information data have been entered into the system information data base via the process described in this section.

f. There will be a delay when exiting from the system information data entry screen whenever a deletion of a system has occurred. Thus, if several deletions are to be done, it is most efficient to do them all at once before exiting menu screen 1.1. When you return (or quit) from this menu screen, the pertinent data bases are packed (physically removing the logically deleted records) and reindexed as appropriate.

4.3 UPDATE USER/SUPPORTER BASELINE ESTIMATE DATA.

4.3.1 <u>User/Supporter Baseline Estimate Data Base Format</u>. The User/
Supporter Baseline Estimate Data Base is completely described in
appendix E. The data fields include:

    (1) Software system identification number

    (2) Update date

    (3) Release duration

    (4) Release overlap

    (5) Percentage of Personnel dedicated to release: computed
        from (3), (4)

    (6) Number of support personnel

    (7) Percentage of support personnel dedicated to this soft-
        ware system

    (8) Average skill level of support personnel

    (9) Total number of changes, corrections, enhancements, con-
        versions, low complexity, medium complexity, high
        complexity, normal priority, urgent priority, emergency
        priority for block 1

  (10) Total number of changes, correction, enhancements, con-
        versions, low complexity, medium complexity, high com-
        plexity, normal priority, urgent priority, emergency
        priority for block 2

(11) Total number of changes, corrections, enhancements, con-
versions, low complexity, medium complexity, high
complexity, normal priority, urgent priority, emergency
priority for block 3.

The User/Supporter Baseline Estimate Data Base is a dBASE III data
base named RAUSBE.DBF.

4.3.2 Update User/Supporter Baseline Estimate Data Base.

a. A flow summary of the procedure for updating system data is
shown in appendix A. Option "B" is selected from the Master Menu
screen 1.0 if you desire to add, delete, or modify user/support baseline
estimate data. You can enter the update option, return to the
previous screen, or exit to the Master Menu.

b. If an entry is to be added, you are requested to enter a valid
software system identification number. Upon entry of a valid identi-
fication number, a screen of variables to be defined is displayed
(see appendix A). After fields (1) - (8) are entered, you can then
enter (or have the system generate) a baseline change profile for
each block release. This is accomplished one block at a time. Once you
choose to enter block information (by entering "B" on screen 1.2.1)
you have 5 choices:

(1) Enter block information manually

(2) Select block information from maintenance data entry

(3) Select block information as an average of maintenance
data

(4) Select block information from a previous baseline estimate

(5) Leave block information as is (all zeroes).

Once the block release information is entered (or generated), you can continue to the next block. After all three block releases have been entered, you can save the new record, edit the information that was just entered, or return/quit without saving the new record. If you choose the option to save the record, available person-months per change, estimated person-months per change, and estimated risk will be calculated for each block and displayed on the screen. You then press any key to continue and screen 1.2 is again displayed for further action.

c. If a current entry is to be deleted, then you are requested to enter a valid software system identification number. You can get a list of current numbers and system/software system names if you so desire. Upon entry of a valid identification number, the system's user/supporter baseline data are displayed. You are cautioned strongly that choosing the option to delete the specified entry will cause the data to be deleted. You are given the option to delete the entry or return to the previous screen without any deletion. When the deletion is complete (if deletion was chosen), menu screen 1.2 is again displayed for further action.

d. If a current entry is to be modified, then you are requested to enter a valid software system identification number. You can get a list of current numbers and system/software system names if you so desire. Upon entry of a valid identification number, the system's user/supporter baseline data are displayed and may be edited. After fields (1) - (8) are edited, you can then edit the baseline change profile for each block release, one at a time. Once you choose to edit block information (by entering "B" on screen 1.2.1) you have 5 choices:

(1) Enter block information manually

(2) Select block information from maintenance data entry

(3) Select block information as an average of maintenance data

(4) Select block information from a previous baseline estimate

(5) Leave block information as is.

Once the block release information is edited, you can then continue to the next block. After all three block releases have been edited, you can save the changes, edit the information just entered, or return/quit without changing the record. If you choose to save the changes, available person-months per change, estimated person-months per change, and estimated risk are recalculated for each block and displayed on the screen. You then press any key to continue and screen 1.2 is again displayed for further action.

4.4 UPDATING EVALUATION ANALYSIS DATA.

4.4.1 Evaluation Analysis Data Base Format.

   a. The "Evaluation Data Base" is actually two data bases, both linked by a software system identification number with the system information data base. The data bases are:

   (1) RAMSS Evaluation Data Base - contains evaluation scores for RAMSS

   (2) RAMSS Software Life Cycle Process Evaluation Data Base - contains low level characteristic evaluation scores for the software life cycle process evaluation.

A complete description of these data bases is given in appendix E.

    b. The data fields for the RAMSS Evaluation Data Base include:

        (1) Software system identification number

        (2) Update date

        (3) Use flag

        (4) Documentation score: average of scores in (5)

        (5) Documentation scores for Modularity, Descriptiveness, Consistency, Simplicity, Expandability, and Instrumentation

        (6) Source listings score: average of scores in (7)

        (7) Source listing scores for Modularity, Descriptiveness, Consistency, Simplicity, Expandability, and Instrumentation

        (8) Product score: average of scores in (4) and (6)

        (9) Personnel score: average of scores in (10)

       (10) Personnel scores for Management, Technical, Support, and Contractor

       (11) Support systems score: average of scores in (12)

       (12) Support systems scores for Host, Software Bench, Laboratory Integrated Test, Operational Integrated Test, Configuration Management System, and Other Systems

(13) Facility score: average of scores in (14)

(14) Facility scores for General and Support Systems

(15) Software support resources score: average of scores in (9), (11), (13)

(16) Software configuration management score: average of scores in (17)

(17) Software configuration management scores for Identification, Control, Status Accounting, and Audit/Review

(18) Project management score: average of scores in (19)

(19) Project management scores for Planning, Organization Structure, Design Methods, Code/Implementation Methods, Test Strategies, and Project Interfaces

(20) Software life cycle process score: average of scores in (16), (18)

(21) Software supportability score: average of scores in (8), (15), (20)

(22) Software supportability confidence score

(23) Software supportability evaluated risk (computed from risk regression equation).

Fields (17) and (19) can either be entered directly or computed as averages of the lower level scores in the software life cycle process data base. If the lower level scores exist, fields (17) and (19) will be computed from the lower level scores and cannot be edited.

The RAMSS Evaluation Data Base is a dBASE III data base named RAEVAL.DBF.

c. The data fields for the Software Life Cycle Process Evaluation Data Base include:

(1) Software system identification number

(2) Update date

(3) Software configuration management score for Identification: average of scores in (4)

(4) 40 Identification scores

(5) Software configuration management scores for Control: average of scores in (6)

(6) 40 Control scores

(7) Software configuration management score for Status Accounting: average of scores in (8)

(8) 40 Status Accounting scores

(9) Software configuration management scores for Audit/ Review: average of scores in (10)

(10) 40 Audit/Review scores

(11) Software project management score for Planning: average of scores in (12)

(12) 40 Planning scores

(13) Software project management scores for Organization: average of scores in (14)

(14) 40 Organization scores

(15) Software project management scores for Design methods: average of scores in (16)

(16) 40 Design Method scores

(17) Software project management scores for Implementation methods: average of scores in (18)

(18) 40 Implementation Method scores

(19) Software project management scores for Test Strategies: average of scores in (20)

(20) 40 Test Strategy scores

(21) Software project management scores for Project interfaces: average of scores in (22)

(22) 40 Project Interface scores.

d. The characteristic scores for the major factors of configuration management and project management are automatically transferred to the same-named fields in the RAMSS evaluation Data Base after these values are computed from the lower level characteristic evaluation scores. The Software Life Cycle Process Evaluation Data Base is a dBASE III data base named RASLCP.DBF.

4.4.2 Updating Evaluation Analysis Data Base.

a. A flow summary of the procedure for updating evaluation
analysis data is shown in appendix A. If option "E" is selected from
the Master Menu screen 1.0, then a menu screen 1.2 will be displayed
which indicates you desire to add, delete, or modify data in the
RAMSS evaluation Data Base or the Software Life Cycle Process
Evaluation Data Base. You can enter the update option, return to the
previous screen, or exit to the beginning introductory screen.

b. If an update option is entered, you will be prompted to enter
a software system identification number. If you want to see a list
of existing systems, enter Ø. Upon entry of a valid identification
number, screen 1.3.1 will be displayed. At this point you may choose
to update the RAMSS Evaluation database (RAEVAL) or the Software Life
Cycle Process Evaluation data base (RASLCP).

c. If the RAMSS Evaluation data base is selected for update (by
entering option "E" on screen 1.3.1), one of three processes will be
performed depending on the update option you selected on screen 1.3:

(1) Add Data

If the evaluation data are being created for the selected
software system, the field names are displayed with
default values of Ø. You may then enter scores for all
editable fields. After entering the scores, you may save
the new data, edit the scores just entered, do a
"what-if" analysis, or quit/return without saving the new
data. If you save the new data, the computed higher-
level scores will be displayed, along with the evaluated
risk and the new record will be written to the RAEVAL
database. The "what-if" analysis allows you to enter
evaluation scores in order to compute evaluated risk
without actually saving the values to the data base.

(2) Modify Existing Data

If you are modifying existing evaluation data, the field
names are displayed with their current values. You may
then enter scores for all editable fields. If the system
has Software Life Cycle Process Evaluation data, you will
not be able to edit the Project Management or Configura-
tion Management scores. After all the scores have been
entered, you may save the new values, edit the scores
just input, do a "what-if" analysis, or quit/return
without saving the new values.

It is important to note that if the evaluation data that
you are modifying have been used in computing the current
evaluated risk regression equation coefficients, any
changes to the scores that are saved make these coeffi-
cients invalid. You will need to follow the procedures
outlined in section 4.6.2 to update the risk regression
coefficients. Warning #1 message will appear on all
screens and reports until you have updated the coeffi-
cients. See section 4.1c. for more details.

The "what-if" analysis allows you to change evaluation
scores without actually changing the values in the RAEVAL
data base. This option can be used to see what happens
to the evaluated risk when scores are changed.

(3) Delete Data

If evaluation data are to be deleted, the field names are
displayed along with the current evaluation scores for
the selected software system. You will be asked if these
are the evaluation data that you wish to delete. If the
evaluation data that you are deleting have been used to

compute the current evaluated risk regression ccceffi-
cients, these coefficients will be invalidated.
Warning #1 message will appear on all screens and reports
until you have updated these coefficients. See
section 4.1c for more details. If you respond in the
affirmative, the record will be marked for deletion;
otherwise, the record will not be deleted and you will be
returned to screen 1.3.

d. If the Software Life Cycle Process Evaluation data base is
selected for update (by entering option "P" on screen 1.3.1),
processing continues based upon the update option you selected as
screen 1.3.

(1) Add Data

If you choose to add data to the Software Life Cycle
Process Evaluation data base (RASLCP), there must already
be a record for the selected system in the RAMSS Evalua-
tion data base (RAEVAL). If there is not, you will get
an error message and will not be allowed to enter new
data.

If the selected system does have RAMSS Evaluation data,
screen 1.3.1.3 will be displayed. You may then choose
which of the 10 software life cycle process categories
you wish to enter scores for. Screen 1.3.1.3.1 will then
be displayed which allows up to 40 scores to be entered.
These scores must be integer values in the range 1-6.
After the scores are entered, you may save the new
scores, edit the scores just entered, or quit/return
without saving the new values. If you save the scores,
you will be returned to screen 1.3.1.3. You continue
entering scores until you have done so for each of the
categories you desire.

(2) <u>Modify Existing Data</u>

If you are modifying existing data in the Software Life
Cycle Process Evaluation data base, processing is done as
in the second paragraph in the previous section
(4.4.2.d.1).

It is important to note that if the evaluation data for
the selected system were used in computing the current
evaluated risk regression coefficients, addition or
modification of a record in the Software Life Cycle
Process Evaluation data base will make these coefficients
invalid. You will need to follow the procedure outlined
in section 4.6.2 to update the risk regression coeffi-
cients. Warning #1 message will appear on all screens
and reports until you have updated the coefficients. See
section 4.1c. for more details.

(3) <u>Delete Data</u>

If Software Life Cycle Process Evaluation data are to be
deleted, the system information of the selected software
system will be displayed on screen 1.3.1.4. You will be
asked if this is the system for which you wish to delete
Software Life Cycle Process Evaluation data. If you
answer "Y", the record will be marked for deletion;
otherwise, the record will not be deleted and you will be
returned to screen 1.3.

e. When the data are saved, all computed fields will be automati-
cally updated. No data are saved except by explicitly entering the
save option.   If the option to delete the evaluation data is
selected, then an additional warning is displayed as a precaution,
and you must verify that a deletion is indeed desired. There may be

some delay in processing a deletion request so that data bases can be
repacked and reindexed as is necessary. This is not done until you
leave screen 1.3.

4.5 UPDATE MAINTENANCE RELEASE DATA.

4.5.1 <u>Maintenance Release Data Base Format</u>.

a. The Maintenance Release Data Base is linked by software system
identification number to the system information data base. The
Maintenance Release Data Base contains one or more records of main-
tenance release data for the reported software systems. Each release
data record is identified by a release identification number. A more
complete discussion of this data base is given in appendix E.

b. The data fields for the Maintenance Release Data Base include:

(1) Software system identification number

(2) Release identification number

(3) Update date

(4) Use flag

(5) Number of source lines in system at current release

(6) Percentage of source lines which are HOL

(7) Primary source language

(8) Number of direct software system support personnel
(group 1, group 2)

(9) Average skill level (1..5) of personnel (group 1, group 2)

(10) Percentage of personnel dedicated to this software system as opposed to other software systems (group 1, group 2)

(11) Percentage of personnel time dedicated to this software system release as opposed to other releases of this same software subsystem (group 1, group 2)

(12) Release start date

(13) Release engineering completion date

(14) Release fielded date

(15) Release engineering duration: computed from fields (12), (13)

(16) Available person-month effort for engineering release duration (computed from assigned personnel data)

(17) Estimated/Actual person-months for engineering release duration

(18) Total number of change requests incorporated in this release

(19) Total number of change requests which are corrections

(20) Total number of change requests which are enhancements

(21) Total number of change requests which are conversions

(22) Total number of change requests which are low complexity

(23) Total number of change requests which are medium complexity

(24) Total number of change requests which are high complexity

(25) Total number of change requests which are normal priority

(26) Total number of change requests which are urgent priority

(27) Total number of change requests which are emergency priority.

c. These data fields correspond to or are computed from data fields on the recommended site maintenance data collection form in reference 1.4.5. The Maintenance Release Data Base is a dBASE III data base named RARLSE.DBF.

d. A completed example maintenance data collection form is shown in figure 4-1. To see how to go from this form to the data entry screen 1.4.1, follow through the example below (data base fields are indicated):

(5) Number of source lines - 60

(6) Percent   HOL -   85 percent   (FORTRAN -   80 percent + command/control - 5 percent.)

(7) Primary Language - FORTRAN

Group 1 DATA

(8) Number of persons - 26   (3 + 5 + 7 + 9 + 2)

COMPUTER SOFTWARE RELEASE DATA RECORD			DATE 2/26/86
1. SITE WR-ALC	**2. SYSTEM** JTIDS	**3. SOFTWARE SYSTEM** Class II Terminal	**4. SOFTWARE SYSTEM TYPE** C-E

5. SIZE (K LINES) 60K

6. LANGUAGE

NAME	% SOURCE LINES	HOL (Y/N)
a. FORTRAN	80%	Y
b. ASSEMBLY	15%	N
c. COMMAND/CONTROL	5%	Y
d.		

7. PERSONNEL

		# ORGANIC	% DEDICATED	# CONTRACTOR	% DEDICATED
(LOWEST)	SKILL LEVEL 1.	3	40%		
	SKILL LEVEL 2.	5	50%		
	SKILL LEVEL 3.	7	50%	NA	
	SKILL LEVEL 4.	9	30%		
(HIGHEST)	SKILL LEVEL 5.	2	50%		

8. RELEASE ID/VERSION V1.0	**9. RELEASE START DATE** July 1, 1988	**10. RELEASE ENGINEERING COMPLETION DATE** March 15, 1989	**11. RELEASE FIELD DATE** May 15, 1989

12. RELEASE CHANGE DATA (USE ADDITIONAL ATTACHMENTS AS NECESSARY)

CHANGE REQUEST ID	OPEN DATE	CLOSE DATE	ACTUAL PERSON MONTHS	TYPE (C,H,V)	COMPLEXITY (L,M,H)	PRIORITY (N,U,E)
S100	4/1/88	3/15/89	2.0	C	M	N
S101	4/1/88	3/15/89	1.0	C	L	N
S104	5/1/88	3/15/89	1.0	C	L	N
S105	5/5/88	3/15/89	2.0	C	L	N
S110	5/9/88	3/15/89	3.0	C	M	N
S112	6/10/88	3/15/89	2.0	C	L	N
S113	7/1/88	3/15/89	1.0	C	L	N
S120	7/15/88	3/15/89	8.0	C	H	N
S135	7/20/88	3/15/89	1.0	C	L	N
S136	7/20/88	3/15/89	1.0	C	L	N
S137	7/20/88	3/15/89	1.0	C	L	N
S138	7/20/88	3/15/89	7.0	E	H	N
S140	7/20/88	3/15/89	1.0	C	L	N
S141	7/31/88	3/15/89	2.0	E	M	N
S142	7/31/88	3/15/89	2.0	C	L	N
S143	8/1/88	3/15/89	1.0	C	L	N
S148	8/1/88	3/15/89	2.0	C	L	N
S150	10/1/88	3/15/89	1.0	C	L	U
S152	12/1/88	3/15/89	1.0	C	L	U

AFOTEC FORM XXXX
SEP 85

85-0510-TR-W-III-01

Figure 4-1. Recommended Software Release Data

(9) Average skill - 2.98

Full time equivalent
= (3*.40) + (5*.50) + (7*.50) + (9*.30) + (2*.50)
= 1.2 + 2.5 + 3.5 + 2.7 + 1.0
= 10.9

Total skill
= (1.2*1) + (2.5*2) + (3.5*3) + (2.7*4) + (1.0*5)
= 1.2 + 5.0 + 10.5 + 10.8 + 5.0
= 32.5

Average skill
= 32.5/10.9
= 2.98

(10) Percent personnel dedicated to system - 42

% ded = Full time equivalent/# of persons
= 10.9/26
= .4192

(11) Percent personnel dedicated to release = 100

Group 2 DATA (NA)

(12) Start date - 07/01/88

(13) Engineering completion date - 03/15/89

(14) Field release date - 05/15/89

(17) Actual effort in person-months - 40.0 (add person-months
for all change requests)

(18) Total number of change requests - 19 (Count all change requests)

(19) # of correction requests - 17 (Change requests with Type = "C")

(20) # of enhancement requests - 2 (Change requests with Type = "H")

(21) # of conversion requests - 0 (Change requests with Type = "V")

(22) # of low complexity changes - 14 (Change requests with complexity = "L")

(23) # of medium complexity changes - 3 (Change requests with complexity = "M")

(24) # of high complexity changes - 2 (Change requests with complexity = " H ")

(24) # of normal priority changes - 17 (Change requests with priority = "N")

(26) # of urgent priority changes - 2 (Change requests with priority = "U")

(27) # of emergency priority changes - 0 (Change requests with priority = "E").

4.5.2 Update Maintenance Release Data Base.

a. A flow summary of the procedure for updating maintenance release data is shown in appendix A. If option "M" is selected from

the Master Menu screen 1.0, then menu screen 1.4 is displayed to indicate your desire to add, delete, or modify data in the RAMSS Maintenance Release Data Base. You can enter the update option, return to the previous screen, or exit to the Master Menu screen.

b. If a new maintenance release record is to be added, you must enter a valid software identification number. You can get a list of current numbers and system/software system names if you so desire. Upon entry of a valid identification number, you are prompted to enter a release ID. This release ID must be unique for the particular system selected. You can get a list of current release IDs for the selected system if you wish. Upon entry of a valid release ID, a screen of variables is displayed. You may then enter the new information. After data entry is complete, you can save the new record, edit the information that was just entered, or return/quit without saving the record.

c. If a current maintenance release entry is to be deleted, then you are requested to enter a valid software system identification number. You can get a list of current numbers and system/software system names if you so desire. Upon entry of a valid identification number, you are prompted to enter the release ID of the maintenance release record to be deleted. You can get a list of current release IDs for the selected system if you wish. Upon entry of a valid release ID, the selected system is displayed. You will be asked if this is the record you wish to delete. If the maintenance release data that you are deleting have been used to compute the current estimated person-months per change regression coefficients, these coefficients will be invalidated. Warning #2 message (see section 4.1.c) will appear on all screens and reports until you have updated these coefficients. If you choose to delete the record, it is marked for deletion and screen 1.4 is again displayed for further action.

d. If a current maintenance release entry is to be modified, you must enter a valid (existing) software identification number. Enter 0 to get a list of current numbers and system/software system names. Upon entry of a valid identification number you are prompted to enter a release ID. You can get a list of current release IDs for the selected system if you so desire. Upon entry of a valid release ID, screen 1.4.3 is displayed. This screen contains the variables and existing values for the record selected. You may now edit the information. After editing is complete, you can save the changes, or quit/return without saving the changes. It is important to note that if the maintenance release data that you are modifying were used in computing the current estimated PMPC regression equation coefficients, any changes that you save will make these coefficients invalid. You will have to follow the procedures outlined in section 4.6.4 to update the coefficients. Warning #2 message will appear on all screens and reports until you update the coefficients.

4.6 UPDATE REGRESSION EQUATION COEFFICIENTS.

4.6.1 <u>Evaluated Risk Regression Coefficients Memory File Format.</u>

a. The Risk Regression Coefficients memory file format is more completely described in appendix E. The data variables include:

    (1) Update date

    (2) Invalid flag

    (3) Coefficient for constant term

    (4) Coefficient for criteria: Life Cycle Process

    (5) Coefficient for criteria: Product

(6) Coefficient for major factor: Personnel

(7) Coefficient for major factor: Support Systems

(8) Coefficient for major factor: Facilities.

b. The Risk Regression Coefficient file is a dBASE III memory file named RAMFCO.MEM.

4.6.2 Update Evaluated Risk Regression Coefficients.

a. The Master Menu screen 1.0 contains an option "G" to generate RAMSS reports. One aspect of this report generation is building an ASCII file from the evaluation data base which is used by BMDP to compute new risk regression coefficients. The risk regression equation is used to compute the software supportability risk from the software supportability evaluation scores.

b. The procedure for updating the risk regression equation is summarized below:

(1) Step 1: Make sure all updates to evaluation data are complete (see section 4.4.2 for update details).

(2) Step 2: After selecting option "G" on the Master Menu, select option "B" on the menu screen 1.7 to build an ASCII file for input to BMDP. You then select option "E" to build an ASCII file of evaluation data. Screen 1.7.3.1 will allow you to choose whether to include or exclude a system's evaluation data prior to the actual build. The system ID, system name, and software system name are listed for each record in the RAMSS evaluation data base (RAEVAL), starting from the end of the file. If you want to include the evaluation record

in the analysis, enter .T. in the "USE FOR ANALYSIS" column of the screen for that record; otherwise, enter .F. (The reason the records are listed in reverse order is that the most recently added records are at the end of the file.) The temporary ASCII file created is named RAASCIIE.DAT.

(3) Step 3: Exit from the dBASE III application program and execute the program EVAL.DAT by entering "EVAL". This program will invoke BMDP programs that read the ASCII file, compute the statistics necessary for the risk regression equation, and output three BMDP reports that can be printed. You can print all three reports by entering "PRT EVAL", or you can print one at a time by using the DOS print command:

$$\text{PRINT} \setminus \text{BMDP} \setminus \text{RAMSS} \setminus \begin{cases} \text{EVAL1D.OUT} \\ \text{EVAL5D.OUT} \\ \text{EVAL1R.OUT} \end{cases}$$

(4) Step 4: You must manually locate in the printed report the regression coefficients for the two criteria and three major factors and the linear regression equation constant term (intercept). These values can be found on page 3 of the Risk Regression Analysis Report (EVAL1R). See section 5.3 and appendix C for specific details on where to find these six terms.

(5) Step 5: Reenter dBASE III, execute the dBASE III RAMSS application program (enter DO RAMSS), and select option "C" from the Master Menu screen 1.0 followed by selecting "V" on screen 1.5 to update the current evaluated risk regression equation coefficients.

(6) Step 6:   Enter the new set of six risk regression equation parameters in the respective variables shown on the screen when the "V" option is selected.

(7) Step 7: Save the parameters and exit dBASE III.

c.   It should be noted that an internal flag is set in the risk regression coefficients memory file (RAMFCO.MEM) whenever the BUILD process described in step 2 is completed.   As long as this flag is set, any further risk assessments that are done will contain inconsistencies.   This flag is reset when the update of the regression coefficients as described in steps 5-7 is complete.   You should take care to extract the correct coefficient data from the BMDP printed report and enter these data in the correct data fields as described in steps 4 and 6.

d.   The printed report output from BMDP should be analyzed to assure that the regression equation and the supporting statistical data support the use of the new equation's regression coefficients to predict software supportability risk.   Discussion of these reports and appropriate analysis is contained in section 5.3 and appendix C.

4.6.3   Estimated Person-Months Per Change Regression Coefficients Memory File Format.

a. The Estimated Person-Months Per Change (PMPC) Regression Coefficients memory file format is completely described in appendix E.   The data variables include:

(1) Update date

(2) Invalid flag

(3) Coefficient for constant term

(4) Coefficient for average skill

(5) Coefficient for percent type correction

(6) Coefficient for percent complexity low

(7) Coefficient for percent complexity high

(8) Coefficient for percent priority normal

(9) Coefficient for system type ATD

(10) Coefficient for system type ATE

(11) Coefficient for system type C-E

(12) Coefficient for system type EW

(13) Coefficient for system type OFP.

b. The PMPC Regression Coefficient file is a dBASE III memory file named RAPMCO.MEM.

4.6.4 Update Estimated Person Months Per Change Regression Coefficients.

a. The Master Menu screen 1.0 contains an option "G" to generate RAMSS reports. One aspect of this report generation is building an ASCII file from the maintenance release data base which is used by BMDP to compute new PMPC regression coefficients.

b. The procedure for updating the PMPC regression equation is summarized below:

(1) Step 1: Make sure all updates to maintenance release
data are complete (see section 4.5.2 for update
details).

(2) Step 2: After selecting option "G" on the master menu,
select option "B" on the menu screen 1.7 to
build an ASCII file for input to BMDP. You then
select option "M" to build an ASCII file of
maintenance release data. Screen 1.7.3.2 will
allow you to choose whether to include or
exclude a system's maintenance release data
prior to the actual build. The system ID,
release ID, system name, and software system
name are listed for each record in the mainten-
ance release data base (RARLSE), starting from
the end of the file. If you want to include the
maintenance release record, enter .T. in the
"USE FOR ANALYSIS" column of the screen for that
record; otherwise, enter .F. (The reason the
records are listed in reverse order is that the
most recently added records are at the end of
the file.) The temporary ASCII file created is
RAASCIIM.DAT.

(3) Step 3: Exit from the dBASE III application program and
execute the program MAINT.BAT by entering
"MAINT." This program will invoke BMDP programs
that read the ASCII file, compute the statistics
necessary for the PMPC regression equation, and
output four BMDP reports that can be printed.
You can print all four reports by entering "PRT
MAINT" or you can print one at a time by using the
DOS print command:

$$\text{PRINT} \backslash \text{BMDP} \backslash \text{RAMSS} \backslash \begin{cases} \text{MAINT1D.OUT} \\ \text{MAINT5P.OUT} \\ \text{MAINT7D.OUT} \\ \text{MAINT2R.OUT} \end{cases}$$

(4) Step 4: You must manually locate in the printed report the regression coefficients for the evaluated PMPC variables, the linear regression equation constant term (intercept), and the standard deviation (STD.ERROR OF EST.). These values can be found on page 3 of the Regression Analysis of LN(PMPC) Report (MAINT1R). See section 5.3 and appendix C for more details on where to find these terms.

(5) Step 5: Reenter dBASE III, execute the dBASE III RAMSS application program (enter "DO RAMSS"), and select option "C" from the master menu followed by entering option "P" on screen 1.5 to update the current estimated person-months per change regression equation coefficients.

(6) STEP 6: Enter the new set of PMPC regression equation parameters on screen 1.5.2.

(7) STEP 7: Save the new parameters and exit DBASE III.

It should be noted that an internal flag is set in the estimated person-months per change memory file (RAPMCO.MEM) whenever the build process as described in Step 2 is completed. As long as this flag is set, any further risk assessments that are done will contain inconsistencies. This flag is reset when the update of the regression coefficients as described in Steps 5-7 is complete.

4.7 UPDATE AFOTEC THRESHOLD/GOAL PARAMETERS.

4.7.1 Threshold/Goal Parameter Memory File Format.

a. The data fields for the AFOTEC parameter file include:

(1) Update date

(2) Evaluation score threshold value

(3) Evaluation score goal value

(4) Risk assessment threshold value

(5) Risk assessment goal value.

b. The AFOTEC parameter file is a dBASE III memory file named
RAAFTH.MEM.

4.7.2 Update Threshold/Parameters.

a. A flow summary of the procedure for updating threshold/goal
parameters is shown in appendix A. If option "A" is selected from
the Master Menu screen 1.0, then you are presented with screen 1.6
containing the current values for the AFOTEC parameters which can
then be changed. You may enter an option to save the values, return
to a previous screen (without saving the parameters), or quit to the
master menu (without saving the parameters). These values are only
used in the output reports to discriminate between evaluation and
risk values which are high, medium, and low.

V. Generate RAMSS Reports

SECTION V

GENERATE RAMSS REPORTS

5.1 INTRODUCTION.

One of the key functions of the RAMSS system is the generation of analysis and data reports. The reports can be grouped into three categories: dBASE III reports; BMDP reports; and user developed custom reports. Examples of reports in the first two categories are included in appendices B and C, respectively.

5.2 GENERATE dBASE III RAMSS REPORTS.

a. From the Master Menu screen 1.0 you can select the option "G" to generate RAMSS reports. The resulting menu screen 1.7 of options allows you to generate two classes of dBASE III reports: risk assessment evaluation analysis reports and data base/file reports. The first class of reports is selectable when option "A" on screen 1.7 is entered and includes:

  (1) A1 - User/Supporter Baseline Estimate and Estimated Person Months Per Change and Risk

  (2) A2 - Table of RAMSS Scores for the Complete Evaluation Hierarchy and Evaluated Risk

  (3) A3 - Chart showing percentile for each major factor score relative to all previous evaluations scores. Page 1 is relative to all systems, page 2 is relative to system of the same type as evaluated system

  (4) A4 - Chart showing relative risk reduction potential of each major factor upon software supportability risk

(5) A5 - Plot of software supportability risk curve with the evaluation's estimated and measured risk values displayed for each block release of the user/supporter baseline estimate

(6) A6 - Summary results of the software system's risk assessment for supportability.

After you select which risk assessment evaluation analysis reports are to be printed, you will be prompted to enter the software identification ID of the system on which the reports will be based. Evaluation reports A3, A4, and A5 all require computation time; therefore, if you have selected any of these three reports, you will notice that printing will stop periodically.

b. The second class of reports is selectable when option "D" on screen 1.7 is entered and includes:

(1) D1 - List of Evaluation Data

(2) D2 - List of Maintenance Release Data

(3) D3 - Table of Evaluated Risk Regression Equation Coefficients

(4) D4 - Table of Estimated PMPC Regression Equation Coefficients

(5) D5 - Table of AFOTEC Parameters (Threshold/Goal).

5.3 GENERATE BMDP RAMSS REPORTS.

a. There are two groups of reports generated by BMDP for RAMSS. The first group of reports is generated by BMDP programs that read an

ASCII file of evaluation data; the second group of reports is generated by BMDP programs that read an ASCII file of maintenance release data.

b. Three output files are produced by running the batch file "EVAL" (EVAL1D.OUT, EVAL5D.OUT, and EVAL1R.OUT). You can print all three of these files by entering the command "PRT EVAL" (from the root directory of the RAMSS hard disk in drive C). The reports that are printed are:

> B1 - Evaluations: Initial Setup and Analysis
>
> B2 - Evaluations: Histograms of Factors and Risk
>
> B3 - Evalautions: Risk Regression Analysis

Another option is to print one report at a time. You would do this by using the DOS "PRINT" Command. The three output files are located in the \BMDP\RAMSS directory:

$$
\text{c> PRINT \ BMDP\RAMSS\} \begin{cases} \text{EVAL1D.OUT} \\ \text{EVAL5D.OUT} \\ \text{EVAL1R.OUT} \end{cases}
$$

c. Four output files are produced by running the batch file "MAINT" (MAINT1D.OUT, MAINT5D.OUT, MAINT7D.OUT, MAINT1R.OUT). You can print all four of these files by entering "PRT MAINT" (from the root directory of the RAMSS hard disk in drive C). The reports that are printed are:

> B4 - Maintenance: Initial Setup and Analysis
>
> B5 - Maintenance Profiles: All Releases
>
> B6 - Maintenance: Comparison of Software Type Profiles
>
> B7 - Maintenance: Regression Analysis of ln(PMPC)

Another option is to print one report at a time. You would do this
by using the DOS "PRINT" command. The four output files are located
in the \BMDP\RAMSS directory:

$$
c> \text{PRINT} \setminus \text{BMDP} \setminus \text{RAMSS} \setminus
\begin{cases}
\text{MAINT1D.OUT} \\
\text{MAINT5D.OUT} \\
\text{MAINT1D.OUT} \\
\text{MAINT1R.OUT}
\end{cases}
$$

5.4 GENERATE CUSTOM REPORTS.

        Refer to the dBASE III user's manual (reference 1.4.9) and the
BMDP user's manual (reference 1.4.10) for more details on generating
custom reports.

VI. System Generation, Archival, Recovery

SECTION VI

SYSTEM GENERATION, ARCHIVAL, AND RECOVERY

6.1 INTRODUCTION.

a. This section describes the following system generation
procedures:

(1) Installation of the RAMSS application software and
dBASE III and BMDP system software on a hard disk

(2) Deinstallation off a hard disk

(3) Execution of RAMSS dBASE III programs

(4) Execution of BMDP programs.

b. Archival and recovery procedures include:

(1) Backup and recovery of RAMSS on hard disk

(2) Back up and recovery of RAMSS data bases on floppy
diskettes.

6.2 SYSTEM GENERATION.

6.2.1 <u>System Assumptions/Hardware Configuration.</u>

a. In order to run the RAMSS System, you must have an IBM PC/AT
CPU (or compatible) with (1) 640 K memory and a floating point
coprocessor, (2) one floppy disk drive, (3) one hard disk drive
(Bernoulli).

b. The executable RAMSS software is contained entirely on one Bernoulli hard disk. The Bernoulli hard disk is configured as follows:

```
                          C:
         ┌─────────────────┼─────────────────┐
        SYS               BMDP             DBASEIII
                       ┌───┴───┐          ┌───┴───┐
                      PGMS    RAMSS      PGMS   RAMSS
```

(1) The root directory (C:) should contain the DOS batch files used by RAMSS. (See section 6.2.4). The root directory also contains the system files (as a result of formatting the Bernoulli), and the Bernoulli utilities.

(2) The SYS directory should contain the following files (copied from DOS 3.10 system diskette):

```
                                              VDISK    .SYS
```

(3) BMDP programs should be installed in the C:\BMDP\PGMS directory. (See section 6.2.3).

(4) dBASE III should be installed in the C:\DBASEIII\PGMS directory. (See section 6.2.2).

(5) BMDP control files should be in the C:\BMDP\RAMSS directory. (See section 6.2.4).

(6) dBASE III program files, report format files, *memory* files, data bases, and index files should be in the C:\dBASEIII\RAMSS directory. (See section 6.2.4).

6.2.2 <u>Installation of dBASE III on the Hard Disk</u>. dBASEIII is installed onto the Bernoulli hard disk in directory C:\DBASEIII\PGMS. Follow the steps below to accomplish the installation:

(1) Make C:\DBASEIII\PGMS   the default directory:

```
C> CD \DBASEIII\PGMS
          or
A> CD C:\DBASEIII\PGMS
```

(2) Set the default drive to the floppy drive:

```
C> A:
```

(3) Insert the dBASE III System Disk #1 in drive A and type the following command:

```
A> INSTALL C:      <RETURN>
```

(4) You will see the Hard Disk Installation Screen. Press any key to continue.

(5) You will see a message that tells you how many installa-
tions are available on this disk. Press <RETURN> as
prompted.

(6) When prompted, insert the dBASE III System Disk #2 in
drive A, and press a key when you are ready. When the
files finish copying, remove System Disk #2 from drive A.

dBASE III is now installed on your hard disk in the directory
C:\dBASEIII\PGMS.

See the dBASE III Manual, page 4-5 of "Getting Started in dBASE III
Version 1.1" for complete installation instructions.

6.2.3 <u>Installation of BMDP on the Hard Disk.</u>

(1) Insert the BMDP Master diskette into drive A.

(2) Copy the BMDP.BAT, BMDPRUN.BAT, BMDPINIT.CSD, and
BMDPF2D.EXE files from the BMDP Master diskette to the
\BMDP\PGMS directory of the hard disk:

```
COPY  A:BMDP.BAT          C:\BMDP\PGMS
COPY  A:BMDPRUN.BAT       C:\BMDP\PGMS
COPY  A:BMDPINIT.CSD      C:\BMDP\PGMS
COPY  A:BMDPF2D.EXE       C:\BMDP\PGMS
```

(3) Set the default directory to BMDP PGMS:

```
>CD   C:\BMDP\PGMS
```

(4) You will be using the BMDP copy program (BMDPF2D) for
copying the individual BMDP programs from the diskette to
the hard disk.

a) Insert the 1D diskette into drive A.

b) Type the following:

      C> BMDPF2D   <RETURN>

Enter the drive letter:

      a   <RETURN>

Repeat a and b above for:
- o 2D diskette
- o 6D diskette
- o 7D diskette
- o 4F diskette
- o 2R diskette
- o 5D diskette
- o 1R diskette

See "BMDPC:USER'S Guide to BMDP on the IBM PC" page 3-5 for complete installation instructions.

6.2.4 Installation of RAMSS Application Software from Floppy Diskettes.

a. The RAMSS application software includes:

(1) DOS batch files

(2) BMDP control files

(3) dBASE III program files, report format files, memory files, and RAMSS data bases (with associated index files).

b. The DOS batch files and the BMDP control files are stored on the diskette labeled RAMSS1. The DOS batch files should be copied from RAMSS1 to the root directory of the Bernoulli disk. These batch files all have the extension .BAT, so you can use the COPY command as follows:

                    COPY A:*.BAT   C:\

c. The BMDP control files and BMDP.LOG should be copied from the RAMSS1 diskette to the C:\BMDP\RAMSS directory of the Bernoulli disk. The control files all have the extension .CTL, so you can use the COPY command as follows:

                    COPY A:*.CTL   C:\BMDP\RAMSS

e. The dBASEIII files are contained on two diskettes: RAMSS2 and RAMSS3. RAMSS2 contains the dBASEIII program files. RAMSS3 contains the RAMSS data bases, index files, memory files, and report format files. All files on both of these diskettes should be copied to the C:\DBASEIII\RAMSS directory of the Bernoulli disk. This can be accomplished by entering the COPY command as follows (one diskette at a time):

                    COPY A:*.*   C:\DBASEIII\RAMSS

(See the DOS manual for complete COPY instructions.)

6.2.5 Deinstallation Procedures.

a. Once you have installed dBASE III on the hard disk, it can only be used on that hard disk. The floppy diskettes from which dBASE III was installed are no longer functional. If it becomes

necessary to uninstall dBASE III off the hard disk for some reason, follow the instructions below.

(1) Set the default drive to the floppy drive (A).

(2) Insert the dBASE III system diskette #1 in drive A. (Be sure the hard disk is in drive C). At the A> prompt, enter the following:

    A> UNINSTAL C:

(3) You will see the UNINSTAL Procedure screen. Press any key to continue.

(4) You will see a message telling you how many installations are available after uninstall is complete. Press <RETURN>.

b. See the dBASE III manual, page 5-6 of "Getting Started in dBASE III Version 1.1" for complete uninstall instructions.

6.2.6 Execution of RAMSS Application Programs.

a. In order to boot the RAMSS system, put the RAMSS hard disk in drive C. (If operating system not on hard disk, use the RAMSS system diskette in drive A.) If the system is on, press CTL-ALT-DEL; otherwise, turn the system on. You will see:

```
IOMEGA Bernoulli Box (tm) Vers. 2.3: Port 330H - 2 drives

A>ECHO OFF
                    Welcome to RAMSS
(Risk Assessment Methodology for Software Supportability)
Options:
   - Enter "DB" to access RAMSS data bases and dBASE III
   - Enter "EVAL" to run BMDP analyses of evaluation data
   - Enter "MAINT" to run BMDP analyses of maintenance data
   - Enter "PRT EVAL" to print BMDP evaluation output
   - Enter "PRT MAINT" to print BMDP maintenance output

C>
```

You are in the root directory of the hard disk (drive C). The five choices that are displayed will invoke DOS batch routines. You may enter "RAMSS" any time you have a DOS prompt (e.g., C>) to get back to the root directory and redisplay the 5 choices.

b. DB. Choose "DB" if you wish to access dBASE III. You would do this if you want to (1) enter software system information, evaluation scores, user/supporter baseline estimate information, or maintenance release information, (2) generate dBASE III risk assessment analysis reports or database/file reports, (3) build ASCII files to be used by BMDP, (4) enter new evaluated risk or estimated person-months per change regression coefficients, or (5) update AFOTEC metric boundaries.

After you enter "DB", you will see

```
C>ECHO OFF
RAMSS Data Base Access
NOTE:  Once dBASE has been accessed, enter "DO RAMSS"
Strike a key when ready . . .
```

At this point, press any key to continue. dBASE III is loaded and the following screen is displayed:

dBASE III version 1.10 IBM/MSDOS ***

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Press the F1 key for help
Type a command (or ASSIST) and press the return key (DY).

VI-8

At the . prompt, enter "DO RAMSS". A "welcome" screen is displayed. Enter "C" to continue and the RAMSS Master Menu is displayed. You are now ready to do whatever RAMSS processing is required.

When you are ready to exit dBASE·III, enter "QUIT" from the . prompt. You will be returned to the C> prompt.

c. EVAL. Choose "EVAL" if you want to run BMDP analyses of evaluation data. You would do this only after you have built an ASCII file of evaluation data within the dBASE III RAMSS systems (option "E" on screen 1.7.3).

After you enter "EVAL", you will see:

```
C>ECHO OFF
RAMSS Software Evaluation Analysis
**************************************************
*   Place BMDP MASTER diskette in drive A:   *
**************************************************
Strike a key when ready . . .
```

Put the BMDP Master diskette in drive A and press <RETURN> to begin processing. You will see the BMDP output on the screen as it is produced. After processing is complete, you will be returned to the C> prompt.

d. PRT EVAL. Choose "PRT EVAL" after you have run "EVAL". The three output files produced by EVAL will be printed. After you enter "PRT EVAL", you will see:

```
C>ECHO OFF
Ready to print BMDP output files EVAL*.OUT
Ensure that printer is ready
Strike a key when ready . . .
```

Press any key and the three reports will be printed.

e. MAINT. Choose "MAINT" if you want to run BMDP analysis of maintenance release data. You would do this only after you have

built an ASCII file of maintenance release data within the dBASE III
RAMSS system (option "M" on screen 1.7.3). After you enter "MAINT",
you will see:

```
C>ECHO OFF
RAMSS Software Maintenance Analysis
*************************************************
*  Place BMDP MASTER diskette in drive A:   *
*************************************************
Strike a key when ready . . .
```

Put the BMDP Master diskette in drive A and press <RETURN> to begin
processing. You will see the BMDP output on the screen as it is
being produced. After processing is complete, you will be returned
to the C> prompt.

   f. PRT MAINT. Choose "PRT MAINT" after you have run MAINT. The
four output files produced by MAINT will be printed. After you enter
"PRT MAINT", you will see:

```
C>ECHO OFF
Ready to print BMDP output files MAINT*.OUT
Ensure that printer is ready
Strike a key when ready . . .
```

Press any key and the four reports will be printed.

6.3 ARCHIVAL AND RECOVERY.

6.3.1 Backup and Recovery of RAMSS on Hard Disk. Because of the
difficulty of reconstructing data that may be lost due to power
failure, disk damage, or other unforseen problems, it is recommended
that you periodically back up your RAMSS hard disk. The fastest and
easiest way to do this is to copy your entire hard disk to another
(back-up) hard disk. The procedure for doing this is as follows:

   (1) Make sure your RAMSS hard disk is in drive C, and a
        formatted Bernoulli hard disk is in drive D.

(2) Type the following command:

C>IOMEGA COPY <RETURN>

(If IOMEGA Bernoulli Box is version 2.3, after the A>
prompt, type ICOPY C: D:). You will see the COPY screen.
The target drive is C: and the source drive is D. Enter
the appropriate information and continue with the copy
process.

(See the IOMEGA Bernoulli Box Manual for more information on the
IOMEGA utility.)

6.3.2 <u>Backup and Recovery of RAMSS Data Bases on Floppy Diskettes</u>.

a. Your RAMSS Bernoulli hard disk contains DOS batch files, DOS
command files, BMDP program and control files, dBASE III program
files, memory files, report format files, and RAMSS data bases with
associated index files. Of all of these files, the RAMSS data base
files, index files, and memory files are the only files that change
as a result of user activity. Because of this, it is recommended
that you periodically copy these files from the Bernoulli hard disk
to back-up floppy diskettes. The files you need to copy are
(contained in the C:\dBASEIII\RAMSS directory):

            RASYSI.DBF, RASYSIID.NDX, RASYSISS.NDX
            RAUSBE.DBF, RAUSBEID.NDX
            RAEVAL.DBF, RAEVALID.NDX
            RASLCP.DBF, RASLCPID.NDX
            RARLSE.DBF, RARLSEID.NDX, RARLSESR.NDX
            RAMFCO.MEM
            RAPMCO.MEM
            RAAFTH.MEM

b. If it becomes necessary to restore from the back-up diskettes, simply copy these files from the floppy diskette to the C:\dBASE III\RAMSS directory of the Bernoulli disk.

c. See the DOS manual for instructions on copying files from one drive to another.

A. Example Display Screens
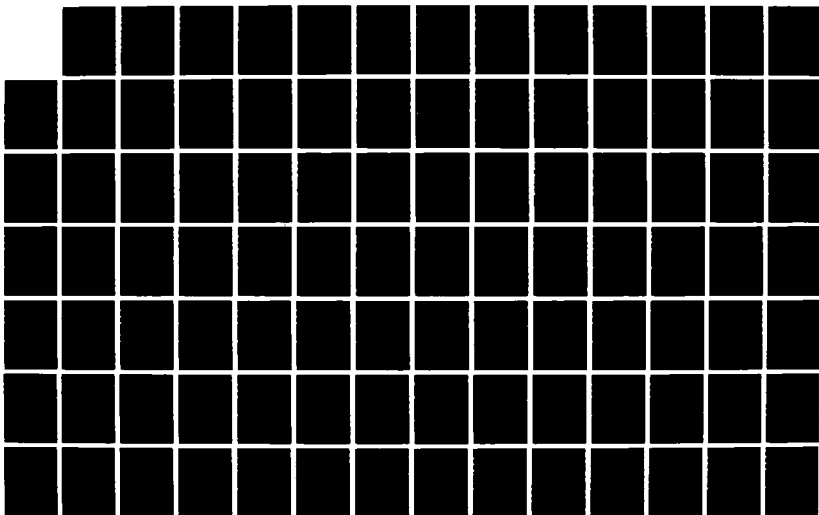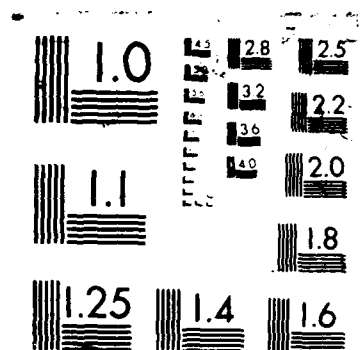
APPENDIX A
EXAMPLE USER DISPLAY SCREENS

APPENDIX A

EXAMPLE DISPLAY SCREENS

A.1 INTRODUCTION.

a. The RAMSS automated tool support is controlled by simple menu driven display screens. Each of the screens is presented in this appendix in hierarchical order along with a brief explanation of features of the screen in a "storyboard" style.

b. There are some general characteristics of all screens. You can always exercise the option "R" to return to the previous screen or "Q" to quit to the Master Menu screen first displayed when the dBASE III RAMSS automated support system is exercised by entering "DO RAMSS". See section 6 for a more detailed description of the system generation and program initiation procedures.

c. The top line of the display screen always contains a title, current date and screen number. The second line usually contains system information (when a specific system identification number has been selected). Lines 3 through 22 are for application information. Lines 23 and 24 are reserved for entering options and displaying error messages. Any error messages are self-explanatory and usually refer to invalid user input.

d. A pictorial view of the display screen hierarchy is shown in figure A-1.
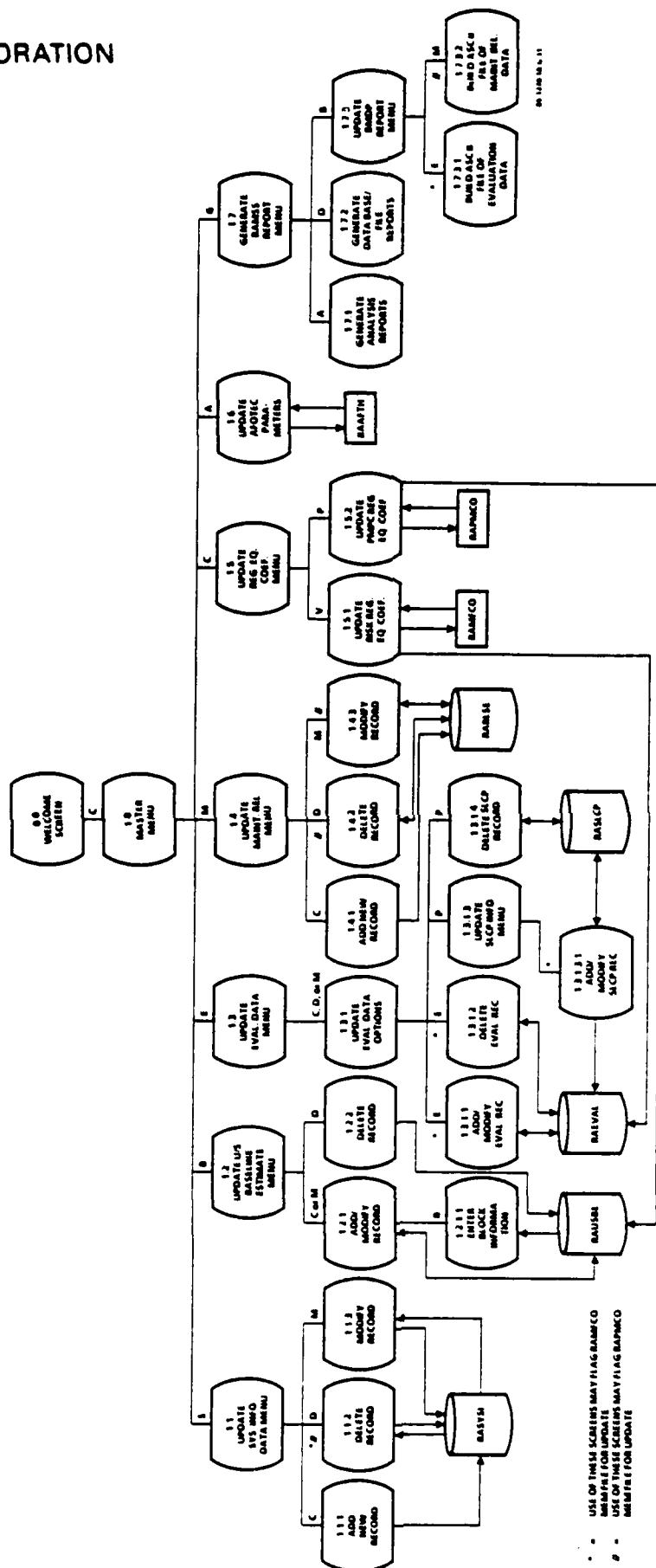
Figure A-1. RAMSS Display Screen Hierarchy

A.2 DISPLAY SCREENS.

This section presents each display screen on one page with a storyboard description of the functions and procedures which can be exercised through the display screen.

```
RAMSS 03/27/86 SCREEN 0.0


                WELCOME

                  TO

            RISK ASSESSMENT

                 FOR

        SOFTWARE SUPPORTABILITY

               (RAMSS)




ENTER OPTION (C-CONTINUE; Q-QUIT)   : :
```

0.0 The Welcome Screen is the first display screen that appears when the dBASEIII program RAMSS is executed ("DO RAMSS"). You have the option to quit ("q") or continue ("C") to the RAMSS Master Menu.

RAMSS 03/27/86 SCREEN 1.0

MASTER MENU

S - Update System Information Data

B - Update User / Supporter Baseline Estimate

E - Update Evaluation Data

M - Update Maintenance Release Data

C - Update Regression Equation Coefficients

A - Update AFOTEC Parameters

G - Generate RAMSS Reports

Q - Quit

ENTER OPTION   : :

1.0 This screen is the RAMSS Master Menu. It serves as the driver menu for the entire system; that is, all major functions are selected from this screen.

NOTE: You can get back to this screen from other screens by entering "Q" (Quit).

```
RAMSS 03/27/86 SCREEN 1.1

UPDATE SYSTEM INFORMATION DATA

         OPTIONS

C - Create Entry

D - Delete Entry

M - Modify Entry

R - Return To Previous Screen

Q - Quit



ENTER OPTION   : :
```

1.1 This screen is the Update System Information Data Menu. From this screen you can choose to add a record to the RASYSI data base (C), delete a record from the RASYSI data base (D), modify a record in the RASYSI data base (M), or return to the Master Menu (R or Q).

```
           RAMSS 03/27/86 SCREEN 1.1.1
           CREATE SYSTEM INFORMATION RECORD

   System ID (will be assigned by the system)  :    :   ..   ..


               System                           :    :

               Software System                  :    :    :

               Software System Type             :    :
               (ATD, ATE, C-E, EW,
               OFP, SIM, SUP )

               User                             :    ::

               Supporter                        :    ::

               Creation Date                    :03/27/86:   :  :


   ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)
```

1.1.1 This is a data entry screen which allows you to add a new record into the RASYS1 data base. After entering the new data, you can edit the data you just entered (E), save the new data (S), return to screen 1.1 (R), or return to the Master Menu (Q).

```
                RAMSS 03/27/86 SCREEN 1.1.2
                DELETE SYSTEM INFORMATION RECORD

     Select Software System ID to be deleted  : 82:


     System              F-16

     Software System     COMNET TERMINAL    ASSOCIATED DATA:

     Software System Type C-E               Baseline data         yes
                                            Evaluation data       yes
     User                HQ-TAC            S/W Life cycle data    no
                                            Maintenace data       no
     Supporter           WR-ALC

     Update Date         03/05/86


            Are you sure you want to delete this record?  : :
```

1.1.2 This screen displays system information for the system you chose to delete. The "ASSOCIATED DATA" section indicates which of the other RAMSS data bases contain records for the selected software system. If you respond "Y" on this screen, the system information record for the selected system will be deleted and any associated data will be deleted.

```
                RAMSS 03/27/86 SCREEN 1.1.3
                MODIFY SYSTEM INFORMATION RECORD

     Select Software System ID to modify  : 82:


               System                :F-16                :

               Software System       :COMNET TERMINAL     :

               Software System Type  :C-E:

               User                  :HQ-TAC    :

               Supporter             :WR-ALC    :

               Update Date           :03/05/86:


        ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)    : :
```

1.1.3 This is a data entry screen that allows you to modify existing system information for the selected software system. (You will not be allowed to modify System ID). After entering the new data, you can edit the data just entered (E), save the new data (S), return to screen 1.1 (R), or return to the Master Menu (Q).

```
                RAMSS 03/27/86 SCREEN 1.2

    UPDATE USER / SUPPORTER BASELINE ESTIMATE

                     OPTIONS

             C - Create Entry

             D - Delete Entry

             M - Modify Entry

             R - Return To Previous Screen

             Q - Quit




    ENTER OPTION    : :
```

1.2 This screen is the Update User/Supporter Baseline Estimate Menu. From this screen you can choose to add a new record to the RAUSBE data base (C), delete a record from the RAUSBE data base (D), modify an existing record in the RAUSBE data base, or return to the Master Menu (R or Q).

```
                    RAMSS 03/27/86 SCREEN 1.2.1

          *** SYSTEM PROFILE ***
SYSTEM :F-16          SWSYSTEM :COMNET TERMINAL        SWTYPE :C-E
SUPPORTER :WR-ALC     USER :HQ-TAC

          *** SUPPORT CONCEPT ***
BLOCK RLS. DURATION (MONTHS) : 9.00:  BLOCK RLS. OVERLAP (MONTHS) : 3.00:
GROUP # OF PERSONNEL  %DEDICATED TO SYSTEM   AVERAGE SKILL LEVEL
  1    :  15:            : 19:                  :3.00:
  2    :   9:            : 90:                  :3.00:

          *** BASELINE CHANGE PROFILE ***
BLOCK  TOTAL CHANGES   TYPE(C,E,V)   COMPLEXITY(H,M,L)   PRIORITY(E,U,N)
  1        15         ( 15, 0, 0)    (  0,  0, 15)       (  0,  0, 15)
  2        20         ( 15, 5, 0)    (  1,  4, 15)       (  1,  4, 15)
  3        20         ( 13, 7, 0)    (  1,  6, 13)       (  1,  6, 13)

          *** ESTIMATED SOFTWARE SUPPORTABILITY RISK ***
BLOCK  AVAILABLE PMPC   ESTIMATED PMPC   ESTIMATED RISK
  1        5.47            1.98            0.14
  2        3.29            3.11            0.48
  3        3.29            3.57            0.54

ENTER OPTION (B-ENTER BLOCK# 1 INFO; R-RETURN; Q-QUIT)   : :
```

1.2.1 This screen is a data entry screen that is used to add a new record to the RAUSBE data base or modify an existing record in the RAUSBE data base. After entering values for the Support Concept, you can enter block information (B), return to screen 1.2 (R), or return to the Master menu (Q). If you select option B, screen 1.2.1.1 will be displayed. This screen will be redis-played after each block of information is entered.

```
            RAMSS 03/27/86 SCREEN 1.2.1.1
         ENTER BLOCK INFORMATION FOR BLOCK# 1




    OPTIONS
       E – Enter block information manually
       S – Select block information from maintenance data entry
       A – Select block information as an average of maintenance data
       P – Select block information from previous baseline agreement
       L – Leave this block's information as is
       R – Return to previous screen
       Q – Quit






                    ENTER OPTION:   : :
```

1.2.1.1 This screen is initiated by selecting "B" from screen 1.2.1. From this screen, you choose which method will be used to generate one block of information for the Baseline Change Profile. If you select option E, the change profile fields will displayed with their current values and you will be allowed to edit these values. If you select option S, you will be required to enter the software system ID and the release ID of the maintenance release record you wish to use. If you select option A, you will be given the choice of averaging all maintenance release data (ALL) or only those of the same software type of the selected system (SAME). If you select option P, you will be required to enter the software system ID and the block # of the previous baseline estimate you wish to use. Once the block release information has been generated (or entered), you may then continue to the next block (C).

```
                    RAMSS 03/27/86 SCREEN 1.2.2

        *** SYSTEM PROFILE ***
SYSTEM: F-16            SWSYSTEM: COMNET TERMINAL        SWTYPE: C-E
SUPPORTER: WR-ALC       USER: HQ-TAC

        *** SUPPORT CONCEPT ***
BLOCK RLS. DURATION (MONTHS) 9.00     BLOCK RLS. OVERLAP (MONTHS) 3.00
GROUP  # OF PERSONNEL  %DEDICATED TO SYSTEM    AVERAGE SKILL LEVEL
  1         15                 19                     3.00
  2          9                 90                     3.00
        *** BASELINE CHANGE PROFILE ***
BLOCK  TOTAL CHANGES   TYPE(C,E,V)      COMPLEXITY(H,M,L)    PRIORITY(E,U,N)
  1        15        ( 15,  0,  0)     (  0,  0, 15)        (  0,  0, 15)
  2        20        ( 15,  5,  0)     (  1,  4, 15)        (  1,  4, 15)
  3        20        ( 13,  7,  0)     (  1,  6, 13)        (  1,  6, 13)


Are you sure you want to delete this record?    : :
```

1.2.2 This screen displays the User/Supporter Baseline Estimate for the system you selected. If you respond "Y" on this screen, the User/Supporter Baseline Estimate will be deleted.

RAMSS 03/27/86 SCREEN 1.3

UPDATE EVALUATION DATA

OPTIONS

C – Create Entry

D – Delete Entry

M – Modify Entry

R – Return To Previous Screen

Q – Quit

ENTER OPTION   : :

1.3 This screen is the Update Evaluation Data Menu. From this screen you can choose to add a new record to the RAEVAL data base or the RASLCP data base (C), delete a record from the RAEVAL data base or RASLCP data base (D), modify an existing record from the RAEVAL data base or RASLCP data base, or return to the Master Menu (R or Q).

RAMSS 03/27/86 SCREEN 1.3.1

SOFTWARE SYSTEM ID: 82

UPDATE EVALUATION DATA OPTIONS

E - Update RAMSS Evaluation Data
P - Update RAMSS Evaluation Data
    Software Life Cycle Process
R - Return To Previous Screen
Q - Quit

*** REMINDER ***

Any update of current data or addition of new data which the user would like to be considered for inclusion in an update to the current risk regression equation requires execution of a BMDP program (see SCREEN 1.7.3 for RAMSS dBASE III interface), followed by selection of option 'C' from the master menu to enter the coefficients printed as output from the BMDP program. Note that a change to any current data used in the derivation of the current coefficients would make these coefficients invalid.

ENTER OPTION   : :

1.3.1 This screen allows you to choose which evaluation data base is to be updated - RAEVAL (E) or RASLCP(P).

```
                    RAMSS 03/27/86 SCREEN 1.3.1.1
            SWSYSTEM: COMNET TERMIN  SWTYPE: C-E   SWSYSID: 82
SYSTEM: F-16
        RAMSS SOFTWARE SUPPORTIBILITY EVALUATION SCORES

*LIFE CYCLE PROCESS 3.32    *PRODUCT 4.15       *SUPPORT RESOURCES 3.94
PROJECT MANAGEMENT 3.47       DOCUMENTATION 3.97    PERSONNEL 3.53
  Planning               :3.33Modularity      :4.70: Manager    :3.75:
  Organizational Structure :3.33Descriptiveness :3.50: Technical :3.38:
  Design Methods         :4.00Consistency      :3.80: Support    :3.17:
  Implementation Methods :3.50Simplicity       :3.90: Contractor :3.83:
  Test Strategies        :3.67Expandability    :3.40:
  Project Interface      :3.00Instrumentation  :4.50SUPPORT SYSTEMS 3.72
                                                     Host    :4.02:
CONFIGURATION MANAGEMENT 3.17 SOURCE LISTINGS 4.32   Bench   :4.07:
  Identification         :3.33: Modularity      :5.20: Lit     :0.00:
  Configuration Control  :3.50: Descriptiveness :4.20: OIT     :4.11:
  Status Accounting      :3.00: Consistency     :3.50: CMS     :2.92:
  Audit                  :2.83: Simplicity      :5.00: Other   :3.50:
                               Expandability    :4.60FACILITIES 4.58
                               Instrumentation  :3.40: General  :4.50:
                                                       Support Sys. :4.67:
** Computed Overall Score 3.80
** Evaluated Risk 0.55
   S/W Supportability Confidence Assessment :0.70:
ENTER OPTION (E-EDIT; S-SAVE; W-WHAT IF; R-RETURN; Q-QUIT)    : :
```

1.3.1.1 This screen is a data entry screen that is used to add a new record to the RAEVAL data base or modify an existing record from the RAEVAL data base. After you enter scores for all of the editable fields you can edit the values you just input (E), save the new data (S), do a "what-if" analysis (W), return to screen 1.3 (R), or return to the Master Menu (Q).

If option S or W is chosen, the higher level scores (computed from the values you input) and the evaluated risk will be immediately displayed.

```
              RAMSS 03/27/86 SCREEN 1.3.1.2
         SWSYSTEM: COMNET TERMIN   SWTYPE: C-E   SWSYSID: 82
      RAMSS SOFTWARE SUPPORTABILITY EVALUATION SCORES (1..6; 0 - NO DATA)

SYSTEM: F-16

LIFE CYCLE PROCESS        PRODUCT                SUPPORT FACILITY
PROJECT MANAGEMENT          DOCUMENTATION          PERSONNEL
Planning           3.33     Modularity       4.70  Manager      3.75
Organization Structure 3.33 Description      3.50  Technical    3.38
Design Methods     4.00     Consistency      3.80  Support      3.17
Code Methods       3.50     Simplicity       3.90  Contractor   3.83
Test Strategies    3.67     Expandability    3.40
Organization Interface 3.00 Instrumentation 4.50  SUPPORT SYSTEMS
                                                   Host   4.02
CONFIGURATION MANAGEMENT    SOURCE LISTINGS        Bench  4.07
Identification     3.33     Modularity       5.20  Lit    0.00
Status Accounting  3.00     Description      4.20  Oit    4.11
Configuration control 3.50  Consistency      3.50  Other  3.50
Audit              2.83     Simplicity       5.00
                            Expandability    4.60  FACILITIES
                            Instrumentation 3.40  Office       4.50
                                                   Environment 4.67

        S/W Supportability Confidence Assessment 0.70
Are you sure you want to delete this record?  : :
```

1.3.1.2 This screen displays the evaluation data for the system you selected. If you respond "Y" on this screen, the evaluation data in RAEVAL will be deleted for the selected system. If the system also has a record in the RASLCP data base, that record will be deleted also.

RAMSS 03/27/86 SCREEN 1.3.1.3
UPDATE SOFTWARE LIFE CYCLE PROCESS INFORMATION

CONFIGURATION MANAGEMENT SCORES

01 - Identfication
02 - Configuration Control
03 - Status Accounting
04 - Audit/Review

SOFTWARE PLANNING MANGEMENT SCORES

05 - Planning
06 - Organizational Structure
07 - Design Methods
08 - Implementation Methods
09 - Testing Methods
10 - Project Interfaces

ENTER OPTION (R-RETURN; Q-QUIT)   :   :

1.3.1.3 This screen is the Update Software Life Cycle Process Information Menu. From this screen, you select which category in the software life cycle process you wish to enter scores for. You will be returned to this screen each time after entering a category of scores. Once you have entered scores for all the categories you wish you can return to screen 1.3 (R), or return to the Master Menu (Q).

```
                    RAMSS 03/27/86 SCREEN 1.3.1.3.1
              UPDATE SOFTWARE LIFE CYCLE PROCESS INFORMATION

SYSTEM: F-16     SWSYSTEM: COMNET TERMIN    SWTYPE: C-E     SWSYSID: 82

  SCMID01  :0:     SCMID09  :0:    SCMID17  :0:   SCMID25  :0:   SCMID33  :0:

  SCMID02  :0:     SCMID10  :0:    SCMID18  :0:   SCMID26  :0:   SCMID34  :0:

  SCMID03  :0:     SCMID11  :0:    SCMID19  :0:   SCMID27  :0:   SCMID35  :0:

  SCMID04  :0:     SCMID12  :0:    SCMID20  :0:   SCMID28  :0:   SCMID36  :0:

  SCMID05  :0:     SCMID13  :0:    SCMID21  :0:   SCMID29  :0:   SCMID37  :0:

  SCMID06  :0:     SCMID14  :0:    SCMID22  :0:   SCMID30  :0:   SCMID38  :0:

  SCMID07  :0:     SCMID15  :0:    SCMID23  :0:   SCMID31  :0:   SCMID39  :0:

  SCMID08  :0:     SCMID16  :0:    SCMID24  :0:   SCMID32  :0:   SCMID40  :0:

ENTER CHOICE (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)  : :
```

1.3.1.3.1 This is a data entry screen which allows you to enter up to 40 scores for the software life cycle process category you chose on screen 1.3.1.3. Once you have entered the scores, you may edit the values just input (E), save the scores (S), return to screen 1.3.1.3 (R), or return to the Master Menu (Q).

RAMSS 03/27/86 SCREEN 1.3.1.4

DELETE SOFWARE LIFE CYCLE PROCESS INFORMATION

SYSTEM ID   82

SYSTEM   F-16

SOFTWARE SYSTEM   COMNET TERMINAL

USER   HQ-TAC

SUPPORTER   WR-ALC

UPDATE DATE   03/05/86

Is this the system for which you want to delete
Software Life Cycle Process Information?   : :

1.3.1.4 This screen displays the system information of the system for which you wish to delete Software Life Cycle Process Information. If you respond "Y" on this screen, the Software Life Cycle process information for the selected system will be deleted. Otherwise, you will be returned to screen 1.3.

RAMSS 03/27/86 SCREEN 1.4

UPDATE MAINTENANCE RELEASE DATA

OPTIONS

C - Create Entry

D - Delete Entry

M - Modify Entry

R - Return To Previous Screen

Q - Quit

ENTER OPTION   : :

1.4 This screen is the Update Maintenance Release Data Menu. From this screen you can choose to add a new record to the RARLSE data base (C), delete a record from the RARLSE data base (D), modify an existing record in the RARLSE data base (M), or return to the Master Menu (R or Q).

```
              RAMSS 03/27/86 SCREEN 1.4.1
              CREATE MAINTENANCE RELEASE RECORD

         SYSTEM ID:  82      RELEASE ID: A
                             RELEASE DATA
 BACKGROUND DATA
 Update Date :03/27/86:        Start Date :  /  /  :
 Number of source lines (thousands) :  OEngineering Completion Date :  /  /
 % HOL : 0:                          Field Release Date :  /  /  :
 Primary Language :        :
                                Actual effort (person months) :    0.0

 Group 1 Support                  Total # of change requests :    0:
 Number persons :   0:            #of correction requests :    0:
 Average skill :0.00:             #of enhancement requests :    0:
 % Personnel dedicated to system :0.00:  #of conversion requests :    0:
 % Person time dedicated to release :0.00:  #of low complex requests :    0:
                                  #of medium complex requests :    0:
 Group 2 Support                  #of high complex requests :    0:
 Number persons :   0:            #of normal priority requests :    0:
 Average skill :0.00:             #of urgent priority requests :    0:
 % Personnel dedicated to system :0.00:  #of emergency priority requests :    0
 % Person time dedicated to release :0.00:

 ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)    :  :
```

1.4.1 This is a data entry screen that allows you to add a record to the RARLSE data base. After entering the new data, you can edit the values just entered (E), save the new record (S), return to screen 1.4 (R), or return to the Master Menu (Q).

```
                RAMSS 03/27/86 SCREEN 1.4.2
                DELETE MAINTENANCE RELEASE DATA

        SYSTEM ID:  82       RELEASE ID: A
                             RELEASE DATA
BACKGROUND DATA
Update Date 03/27/86            Start Date 07/01/88
Number of source lines (thousands)  60  Engineering Completion Date 03/15/89
% HOL 85                       Field Release Date 05/15/89
Primary Language FORTRAN       Actual effort in person months  40.0
                               Total # of change requests  19
Group 1 Support                # of correction requests  17
Number persons   26            # of enhancement requests  2
Average skill 2.98             # of conversion requests  0
% Personnel dedicated to system 0.42   # of low complex requests  14
% Person time dedicated to release 1.00  # of medium complex requests  3
                               # of high complex requests  2
Group 2 Support                # of normal priority requests  17
Number persons   0             # of urgent priority requests  2
Average skill 0.00             # of emergency priority requests  0
% Personnel dedicated to system 0.00
% Person time dedicated to release 0.00

Are you sure you want to delete this record?  : :
```

1.4.2 This screen displays the maintenance release data for the selected system. If you respond "Y" on this screen, the data that is displayed will be deleted. Otherwise, you will be returned to screen 1.4.

```
            RAMSS 03/27/86 SCREEN 1.4.3
            MODIFY MAINTENANCE RELEASE DATA

         SYSTEM ID:  82      RELEASE ID: A
                             RELEASE DATA
BACKGROUND DATA
Update Date :03/27/86:          Start Date :07/01/88:
Number of source lines (thousands) :  60Engineering Completion Date :03/15/89:
% HOL : 85:                     Field Release Date :05/15/89:
Primary Language :FORTRAN  :

                                Actual effort (person months) :    40.0

Group 1 Support
Number persons :  26:           Total # of change requests :   19:
Average skill :2.98:            #of correction requests :   17:
% Personnel dedicated to system :0.42:   #of enhancement requests :    2:
% Person time dedicated to release :1.00:#of conversion requests :    0:
                                         #of low complex requests :   14:
                                         #of medium complex requests :    3:
Group 2 Support                          #of high complex requests :    2:
Number persons :   0:           #of normal priority requests :   17:
Average skill :0.00:            #of urgent priority requests :    2:
% Personnel dedicated to system :0.00:   #of emergency priority requests :    0
% Person time dedicated to release :0.00:

ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)    :  :
```

1.4.3 This is a data entry screen that allows you to modify existing maintenance release data for the selected software system. After entering the new data, you can edit the values just entered (E), save the new values (S), return to screen 1.4 (R), or return to the Master Menu (Q).

```
              RAMSS 03/27/86 SCREEN 1.5

         UPDATE REGRESSION EQUATION COEFFICIENTS

                       OPTIONS

              V - Update Evaluated Risk Coefficients

              P - Update Estimated PMPC Coefficients

              R - Return to previous screen

              Q - Quit



                    ENTER OPTION  : :
```

1.5 This screen is the Update Regression Equation Coefficients Menu. From this screen you can choose to update the evaluated risk regression equation coefficients (V), update the estimated person-months per change regression equation coefficients (P), or return to the Master Menu (R or Q).

RAMSS 03/27/86 SCREEN 1.5.1

UPDATE RISK REGRESSION EQUATION COEFFICIENTS

Intercept   : 4.90401:

Factor 1 (AMANAGE) Coefficient   :-0.66174:

Factor 2 (APRODUCT) Coefficient   :-0.29131:

Factor 3 (AEPER) Coefficient   :-0.15600:

Factor 4 (AESYS) Coefficient   :-0.25120:

Factor 5 (AEFAC) Coefficient   : 0.04294:

ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)   : :

1.5.1 This screen is a data entry screen which allows you to update the values in the RAMFCO.MEM dBASE III memory file. These values include the risk regression coefficients and the intercept value. Once you have entered the new values, you may edit the data just entered (E), save the new values to RAMFCO.MEM (S), return to screen 1.5 (R), or return to the Master Menu (Q).

```
                    RAMSS 03/27/86 SCREEN 1.5.2

             UPDATE ESTIMATED PMPC EQUATION COEFFICIENTS


    Standard Deviation                      :  0.95090:
    Intercept                               :  0.07083:

    Factor 1 (AVGSKILL) Coefficient         :  0.54837:
    Factor 2 (PTCORR)   Coefficient         : -0.02948:
    Factor 3 (PCLOW)    Coefficient         :  0.21815:
    Factor 4 (PCHIGH)   Coefficient         :  2.09568:
    FACTOR 5 (PPNORM)   Coefficient         : -1.57228:

    Software Type ATD Coefficient           : -0.50845:
    Software Type ATE Coefficient           :  0.14413:
    Software Type C-E Coefficient           :  0.35255:
    Software Type EW  Coefficient           :  0.85802:
    Software Type OFP Coefficient           :  0.04114:


    ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)    :  :
```

1.5.2 This screen is a data entry screen which allows you to update the values in the dBASE III memory file RAPMCO.MEM. These values include the estimated person-months per change coefficients, the intercept value, and the standard deviation. Once you have entered the new values, you may edit the data just entered (E), save the new values to RAPMCO.MEM (S), return to screen 1.5 (R), or return to the Master Menu (Q).

A-27

RAMSS 03/27/86 SCREEN 1.6

UPDATE AFOTEC SPECIFIC PARAMETERS

Evaluation Metric Boundaries (between 1 and 6)

:5.00: GOAL
:3.50: THRESHOLD

Risk Metric Boundaries (between 0 and 1)

:0.20: GOAL (Low Risk)
:0.50: THRESHOLD (High Risk)

ENTER OPTION (E-EDIT; S-SAVE; R-RETURN; Q-QUIT)   : :

1.6 This screen is a data entry screen that allows you to update the AFOTEC specific parameters contained in the dBASE III memory file RAAFTH.MEM. Once you have entered the new values, you may edit the data just entered (E), save the new values to RAAFTH.MEM (S), or return to the Master Menu (R or Q).

RAMSS 03/27/86 SCREEN 1.7

GENERATE RAMSS REPORTS

A - dBASE III Risk Assessment Analysis Reports

D - dBASE III Data Base / File Reports

B - Build ASCII Files for BMDP Reports

R - Return to Previous Screen

Q - Quit

ENTER OPTION : :

1.7 This screen is the Generate RAMSS Reports Menu. From this screen, you can choose to generate risk assessment analysis reports (A), generate data base/file reports (D), build ASCII files to be used by BMDP to calculate regression equation coefficients (B), or return to the Master Menu (R or Q).

RAMSS 03/27/86 SCREEN 1.7.1

GENERATE dBASE III RISK ASSESSMENT ANALYSIS REPORTS

SELECT ANALYSIS REPORTS TO PRINT (Y/N)

: : USER / SUPPORTER BASELINE CONCEPT

: : TABLE OF EVALUATION SCORES

: : LINE CHART SHOWING EVALUATION PERCENTILE FOR EACH MAJOR FACTOR

: : LINE CHART SHOWING MAJOR FACTOR RISK IMPACT

: : PLOT OF AVAILABLE PERSON-MONTHS PER CHANGE VS. ESTIMATED RISK

: : SUMMARY REPORT OF SOFTWARE SUPPORTABILITY RISK ASSESSMENT

ENTER OPTION (E-EDIT; P-PRINT; R-RETURN; Q-QUIT)   : :

1.7.1 This screen allows you to choose which risk assessment analysis reports are to be printed. Put "Y" next to the reports you would like printed and "N" next to those that you do not want printed. After you have completed your selections, you may reselect (E), print the selected reports (P), return to screen 1.7 (R), or return to the Master Menu (Q).

RAMSS 03/27/86 SCREEN 1.7.2

GENERATE dBASE III DATA BASE / FILE REPORTS

SELECT DATA BASE / FILE REPORTS TO PRINT (Y/N)

: : EVALUATION DATA BASE

: : MAINTENANCE RELEASE DATA BASE

: : EVALUATED RISK REGRESSION EQUATION

: : ESTIMATED PMPC REGRESSION EQUATION

: : AFOTEC PARAMETERS

ENTER OPTION (E-EDIT; P-PRINT; R-RETURN; Q-QUIT)   : :

1.7.2 This screen allows you to choose which data base/file reports are to be printed. Put a "Y" next to the reports you would like printed and a "N" next to those you do not want printed. After you have completed your selections, you may reselect (E), print the selected reports (P), return to screen 1.7 (R), or return to the Master Menu (Q).

RAMSS 03/27/86 SCREEN 1.7.3

UPDATE BMDP REPORTS

E - Build ASCII File Of Evaluation Data
    (For Update Of Risk Regression Statistical Report)

M - Build ASCII File Of Maintenance Release Data
    (For Update Of Maintenance Profiles and
     Update of PMPC Regression Statistical Report)

R - Return to Previous Screen

Q - Quit

ENTER OPTION   : :

1.7.3 This screen is the Update BMDP Reports Menu. From this screen you can choose to build an ASCII file from RAEVAL (E), build an ASCII file from RARLSE (M), return to screen 1.7 (R), or return to the Main Menu (Q).

```
                RAMSS 03/27/86 SCREEN 1.7.3.1
                BUILD ASCII FILE OF EVALUATION DATA

                      SELECT SOFTWARE SYSTEMS

SWSYSID   SYSTEM              SWSYSTEM        USE FOR ANALYSIS? (Yes=.T.)

   1      CSS                 CSS                    :T:
   3      MEBU                MEBU                   :T:
   4      NCS                 NCS                    :T:
   5      SSC                 SSC                    :T:
   6      ALR-46              ALR-46                 :T:
   7      ALR-69              ALR-69                 :T:
   8      AN/ALQ-131          AGEOP                  :F:
   9      AN/ALQ-131          BTG                    :T:
  10      AN/ALQ-131          OFP                    :T:
  11      AN/ALQ-131          UUT                    :T:
  12      APR-38              APR-38                 :T:
  13      B-52 EVS ATE        ASQ-151                :T:
  14      E-3A AVIONICS ATE   AN/GSM-285(B)          :T:
  15      E-3A AVIONICS ATE   AN/GSM-285(W)          :T:


ENTER OPTION (E-EDIT; B-BUILD; R-RETURN; Q-QUIT)          : :
```

1.7.3.1 This screen allows you to select which records in the RAEVAL data base are to be used by
BMDP in the statistical analysis. Those systems that are to be included should have a "T" in the
"USE FOR ANALYSIS" column. You will be able to page forward until you have seen all the records
desired. Once you have selected the records to be used, you may go back to the beginning of the
file and reselect (E), build the ASCII file (B), return to screen 1.7.3 (R), or return to the Master
Menu (Q).

```
              RAMSS 03/27/86 SCREEN 1.7.3.2
        BUILD ASCII FILE OF MAINTENANCE RELEASE DATA

                 SELECT MAINTENANCE RELEASE

SWSYSID   RLS ID   SYSTEM   SWSYSTEM   USE FOR ANALYSIS?

   1        A        CSS       CSS           :T:
   1        A1       CSS       CSS           :T:
   1        B        CSS       CSS           :T:
   1        C1       CSS       CSS           :T:
   1        D        CSS       CSS           :T:
   1        E        CSS       CSS           :T:
   1        F        CSS       CSS           :T:
   1        G        CSS       CSS           :T:
   1        G1H      CSS       CSS           :T:
   1        I        CSS       CSS           :T:
   1        I1       CSS       CSS           :T:
   1        J        CSS       CSS           :T:
   1        K        CSS       CSS           :T:
   1        L        CSS       CSS           :T:

ENTER OPTION (E-EDIT; B-BUILD; R-RETURN; Q-QUIT)   : :
```

1.7.3.2 This screen allows you to select which records in the RARLSE data base are to be used by BMDP in the statistical analysis. Those systems that are to be included should have a "T" in the "USE FOR ANALYSIS" column. You will be able to page forward until you have seen all the records desired. Once you have selected the records to be used, you may go back to the beginning of the file and reselect (E), build the ASCII file (B), return to screen 1.7.3 (R), or return to the Master Menu (Q).

B. Example dBase III Reports

APPENDIX B

EXAMPLE dBASE III RAMSS REPORTS

B.1 INTRODUCTION.

a. The dBASE III reports are selected for output from a display
screen and support the process of assessing software supportability
risk.   You must select the option "G" from the Master Menu
screen 1.0.   The resulting display screen, 1.7, will allow you to
enter option "A" or option "D".   If option "A" is selected from menu
screen 1.7, then the following printed report selections are dis-
played:

> (1) User/Supporter Baseline Estimate

> (2) Table of Evaluation Scores

> (3) Line Chart of Major Factor Percentiles

> (4) Line Chart of Major Factor Risk Reduction Potential

> (5) Plot of Risk Curve for all Systems and all Systems of the
>   Same Type as the Selected System

> (6) Summary RAMSS Report.

Once you have made your selections, you will be prompted to enter the
software identification number of the system for which the reports
are to be printed.   These printed reports are used in the assessment
of the software system's supportability.   There are many other custom
reports which could be generated using the built-in dBASE III report
capability.   Five such reports can be generated by selecting
option "D" from menu screen 1.7.   The following printed report
options are displayed:

(1)   Evaluation Data Base Raw Data

(2)   Maintenance Release Data Base Raw Data

(3)   Evaluated Risk Regression Equation

(4)   Estimated Person Months Per Change Regression Equation

(5)   AFOTEC Threshold/Goal Parameters.

b.   A pictorial view of the display screen hierarchy for generat-
ing dBASE III and BMDP reports is shown in figure B-1.

B.2   dBASE III RAMSS REPORTS.

This section presents an example of each dBASE III RAMSS
report on one page with an example of the report format and an over-
view of the report content.
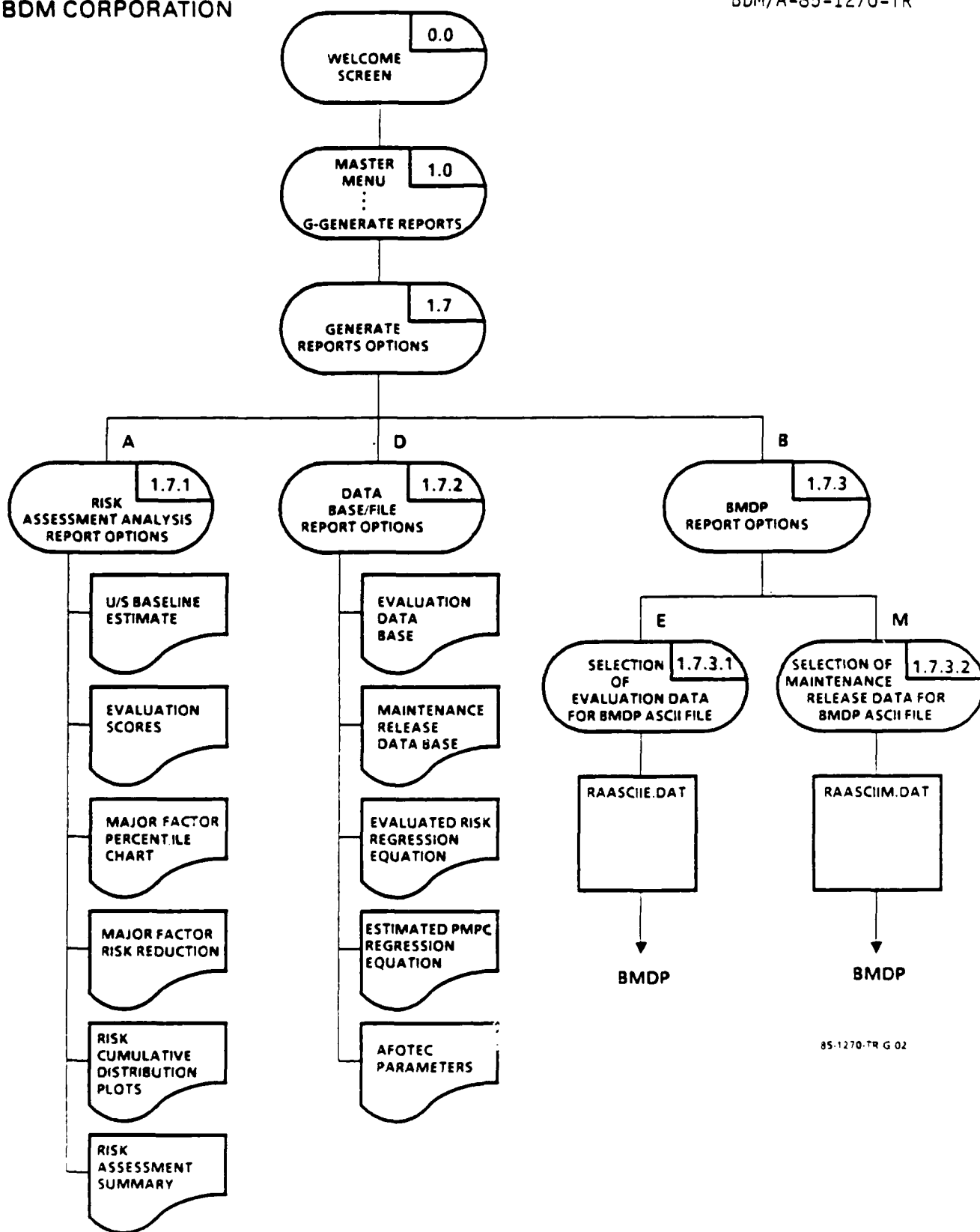
Figure B-1. Hierarchy of RAMSS dBASE III Report Generation

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EVALUATION REPORT A1: USER /SUPPORTER BASELINE CONCEPT

```
***************************************
*            SYSTEM PROFILE            *
*                                      *
*  SWSYSID : 82          SWTYPE : C-E  *
*  SYSTEM : F-16      SUPPORTER: WR-ALC *
*  SWSYSTEM : COMNET TERMINAL  USER : HQ-TAC *
***************************************
```

SUPPORT CONCEPT

Release Schedule: 9.00 Month block release cycle with 3.00 Month overlap

Support Staff : 15 Persons, 19% Dedicated, Avg.skill level 3.00

                 9 Persons, 90% Dedicated, Avg.skill level 3.00

BASELINE SUPPORT PROFILE

BLOCK	TOTAL # CHANGES	TYPE(C,H,V)	COMPLEXITY(H,M,L)	PRIORITY(E,U,N)
1	15	(15, 0, 0)	(0, 0, 15)	(0, 0, 15)
2	20	(15, 5, 0)	(1, 4, 15)	(1, 4, 15)
3	20	(13, 7, 0)	(1, 6, 13)	(1, 6, 13)

ESTIMATED SOFTWARE SUPPORTABILITY RISK

BLOCK	AVAILABLE PERSON MONTHS PER CHANGE	ESTIMATED PERSON MONTHS PER CHANGE	ESTIMATED RISK
1	5.47	1.98	0.14
2	3.29	3.11	0.48
3	3.29	3.57	0.54

Figure B-2. Evaluation Report A1

B.2.1 Report A1: User/Supporter Baseline Concept.

The User Supporter Baseline Estimate report includes a system profile, support concept and baseline support profile which represent a common understanding between the user and supporter of the initial support activity for the subject software system.

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EVALUATION REPORT A2: TABLE OF EVALUATION SCORES

```
*****************************************
*                                       *
*            SYSTEM PROFILE             *
*                                       *
*  SWSYSID  : 82           SWTYPE : C-E *
*                                       *
*  SYSTEM   : F-16      SUPPORTER: WR-ALC*
*                                       *
*  SWSYSTEM : COMNET TERMINAL  USER : HQ-TAC*
*                                       *
*****************************************
```

I. LIFE CYCLE PROCESS   3.32

A. PROJECT MANAGEMENT   3.47

1. Planning 3.33
2. Organizational Structure 3.33
3. Design Methods 4.00
4. Implementation Methods 3.50
5. Test Strategies 3.67
6. Project Interface 3.00

B. CONFIGURATION MANAGEMENT   3.17

1. Identification 3.33
2. Configuration Control 3.50
3. Status Accounting 3.00
4. Audit 2.83

II. PRODUCT   4.15

A. DOCUMENTATION   3.97

1. Modularity 4.70
2. Descriptiveness 3.50
3. Consistency 3.80
4. Simplicity 3.90
5. Expandability 3.40
6. Instrumentation 4.50

B. SOURCE LISTINGS   4.32

1. Modularity 5.20
2. Descriptiveness 4.20
3. Consistency 3.50
4. Simplicity 5.00
5. Expandability 4.60
6. Instrumentation 3.40

III. SUPPORT RESOURCES   3.94

A. PERSONNEL   3.53

1. Manager 3.75
2. Technical 3.38
3. Support 3.17
4. Contractor 3.83

B. SUPPORT SYSTEMS   3.72

1. Host 4.02
2. Bench 4.07
3. Laboratory 0.00
4. Operational 4.11
5. CMS 2.92
6. Other 3.50

C. FACILITIES   4.58

1. General 4.50
2. Support Systems 4.67

Computed Overall Score (Average of I, II, and III): 3.80

Software Supportability Confidence Assessment : 0.70

Software Supportability Evaluated Risk : 0.55

Figure B-3. Evaluation Report A2

B.2.2 Report A2: Table of Evaluation Scores.

The Table of Evaluation Scores report includes all evaluation scores entered for the selected system. The hierarchy scores (which are computed from the lower level scores that were entered) are also included in the report. The last three lines of page 1 summarize the evaluation data by reporting the computed overall score (average of all evaluation scores), the software supportability confidence assessment (per user entry), and the software supportability evaluated risk (computed via the risk regression equation).

If Software Life Cycle Process evaluation scores exist for the selected system, page 2 of the report will present these values; otherwise, the report will consist of only one page.

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EVALUATION REPORT A3: MAJOR FACTOR PERCENTILE CHART

```
********************************
*          SYSTEM PROFILE      *
*                              *
* SWSYSID : 82      SWTYPE : C-E *
*                              *
* SYSTEM : F-16    SUPPORTER: WR-ALC *
*                              *
* SWSYSTEM : COMNET TERMINAL  USER : HQ-TAC *
********************************
```

SOFTWARE LIFE CYCLE PROCESS		0.12
PROJECT MANAGEMENT		0.21
CONFIGURATION MANAGEMENT		0.15
SOFTWARE PRODUCT		0.47
DOCUMENTATION		0.41
SOURCE LISTINGS		0.62
SOFTWARE SUPPORT RESOURCES		0.34
PERSONNEL		0.17
SUPPORT SYSTEMS		0.26
FACILITIES		0.61
SOFTWARE SUPPORTABILITY		0.29

0.0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1.0
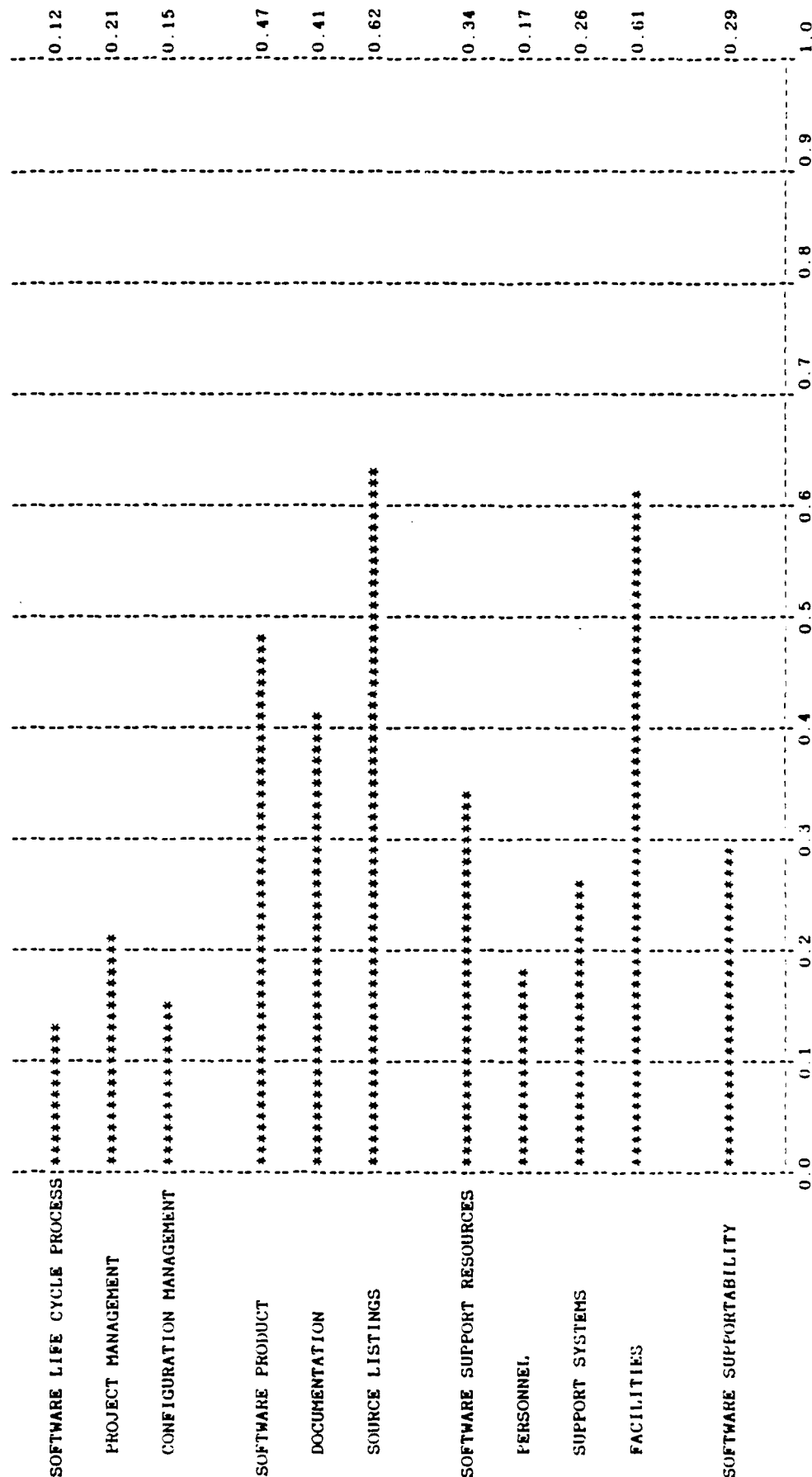
PROPORTION OF SYSTEMS SCORING LESS THAN EVALUATED FACTOR SCORE
(For all Systems)

Figure B-4. Evaluation Report A3

(This page intentionally left blank)

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EVALUATION REPORT A3: MAJOR FACTOR PERCENTILE CHART

```
**********************************
*            SYSTEM PROFILE      *
*                                *
* SWSYSID : 82        SWTYPE : C-E      *
*                                *
* SYSTEM : F-16       SUPPORTER: WR-ALC *
*                                *
* SWSYSTEM : COMNET TERMINAL   USER : HQ-TAC *
**********************************
```

	Value
SOFTWARE LIFE CYCLE PROCESS	0.00
PROJECT MANAGEMENT	0.17
CONFIGURATION MANAGEMENT	0.00
SOFTWARE PRODUCT	0.25
DOCUMENTATION	0.17
SOURCE LISTINGS	0.33
SOFTWARE SUPPORT RESOURCES	0.25
PERSONNEL	0.08
SUPPORT SYSTEMS	0.33
FACILITIES	0.58
SOFTWARE SUPPORTABILITY	0.08
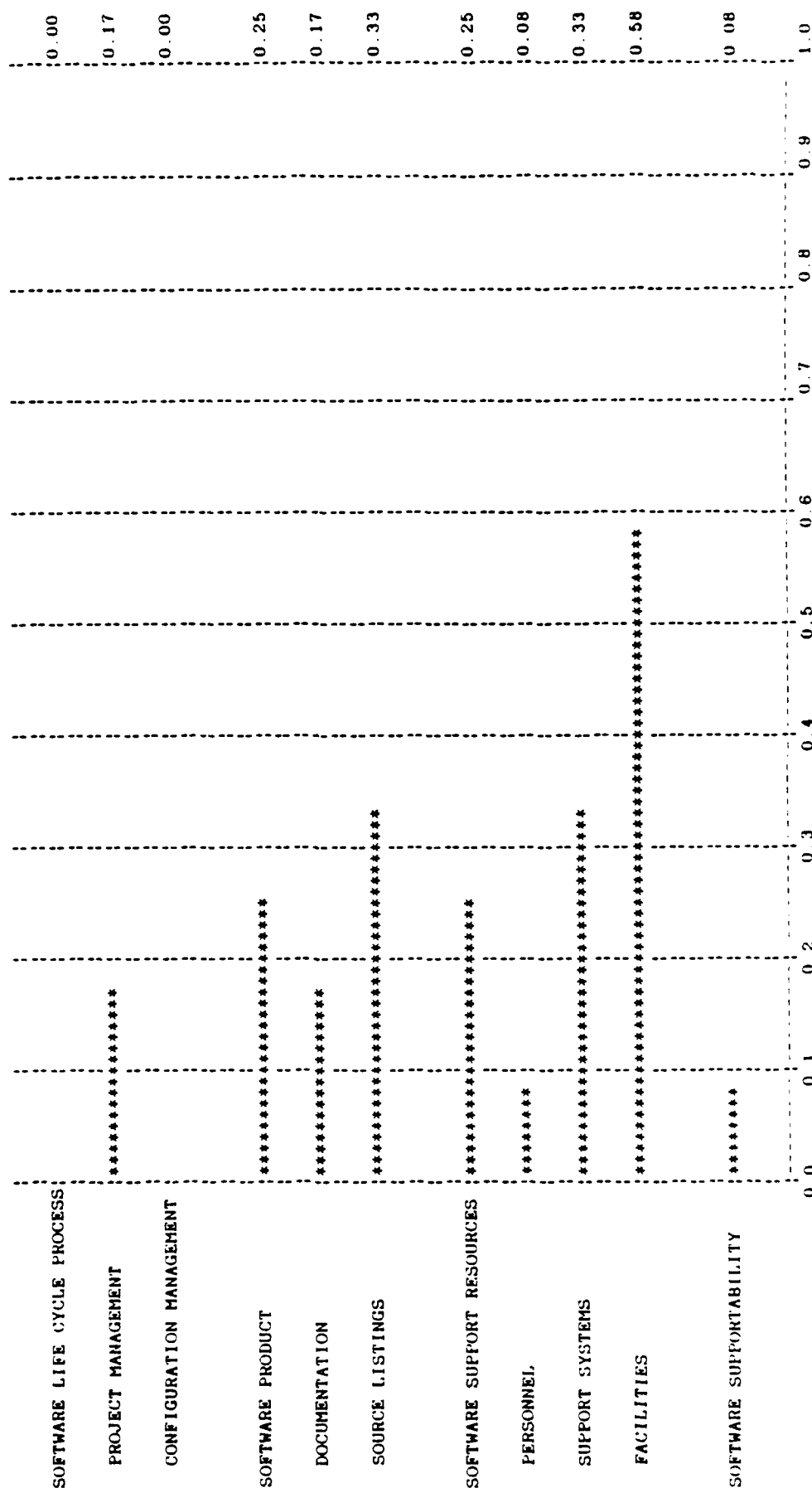
PROPORTION OF SYSTEMS SCORING LESS THAN EVALUATED FACTOR SCORE
(For C-E Systems)

Figure B-4. Eva'ation Report A3 (Concluded)

B.2.3 Report A3: Major Factor Percentile Chart.

The Major Factor Percentile Chart gives a graphic view of the proportion of existing systems with evaluation scores which are lower than the selected system for each major factor. Page 1 of the report does this based on all systems, while page 2 is based only on systems of the same software type as the selected system.

Note that the higher the proportion of systems scoring less than the selected system, the better the chances of supporting that system (based on comparison).

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EVALUATION REPORT A4: MAJOR FACTOR RISK IMPACT CHART

```
***************************************
*                                     *
*         SYSTEM PROFILE              *
*                      SWTYPE  : C-E  *
* SWSYSID : 82         SUPPORTER: WR-ALC *
* SYSTEM  : F-16       USER    : HQ-TAC *
*                                     *
* SWSYSTEM : COMNET TERMINAL          *
***************************************
```


		0.38
PROJECT MANAGEMENT		0.21
CONFIGURATION MANAGEMENT		0.23
SOFTWARE PRODUCT		0.13
DOCUMENTATION		0.07
SOURCE LISTINGS		0.06
SOFTWARE SUPPORT RESOURCES		0.22
PERSONNEL		0.09
SUPPORT SYSTEMS		0.14
FACILITIES		0.00

SOFTWARE LIFE CYCLE PROCESS
PROJECT MANAGEMENT
CONFIGURATION MANAGEMENT
SOFTWARE PRODUCT
DOCUMENTATION
SOURCE LISTINGS
SOFTWARE SUPPORT RESOURCES
PERSONNEL
SUPPORT SYSTEMS
FACILITIES

0.0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1.0
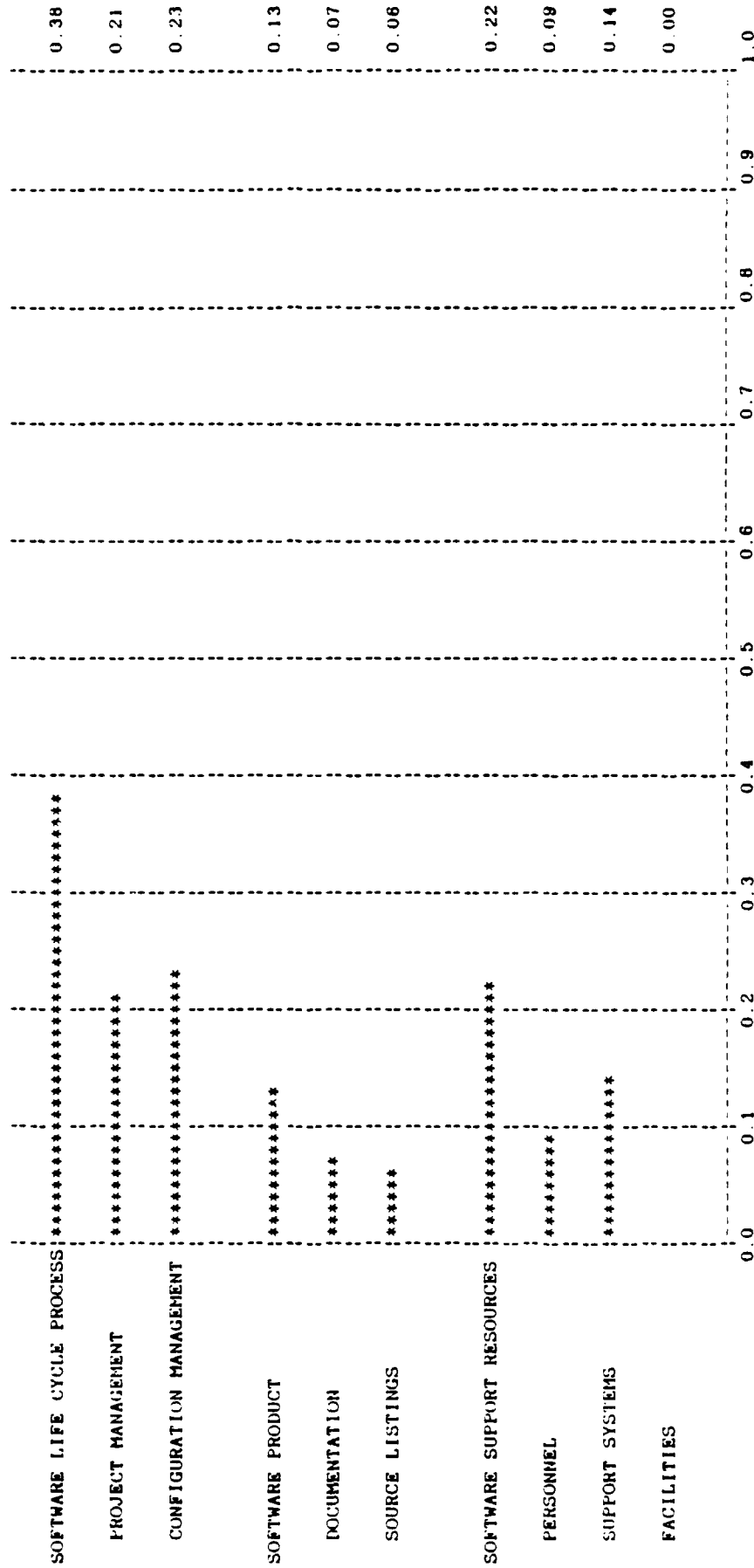
REDUCTION OF S/W SUPPORTABILTY RISK BY MAXIMUM FACTOR IMPROVEMENT

Figure B-5. Evaluation Report A4

B.2.4 Report A4: Major Factor Risk Impact Chart.

The Major Factor Risk Impact Chart graphically depicts the potential of each major factor to reduce the software supportability risk. This risk reduction potential is computed as follows:

(1) Risk is computed for the selected system using the current evaluation scores for that system.

(2) For each major factor, one at a time:

a) The major factor is set to 6 (maximum score), while leaving the other scores as they are, and the risk is recalculated.

b) The recalculated risk is subtracted from the original risk value. The difference is the risk reduction potential for that major factor. This value is plotted with a line of asterisks and also printed along the right hand edge of the report.

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EVALUATION REPORT A5: PLOT OF PMPC VS. RISK

```
***********************************************
*                                             *
*              SYSTEM PROFILE                 *
*                                             *
*  SWSYSID  : 82          SWTYPE  : C-E       *
*                                             *
*  SYSTEM  : F-16         SUPPORTER: WR-ALC   *
*                                             *
*  SWSYSTEM : COMNET TERMINAL   USER : HQ-TAC *
*                                             *
***********************************************
```
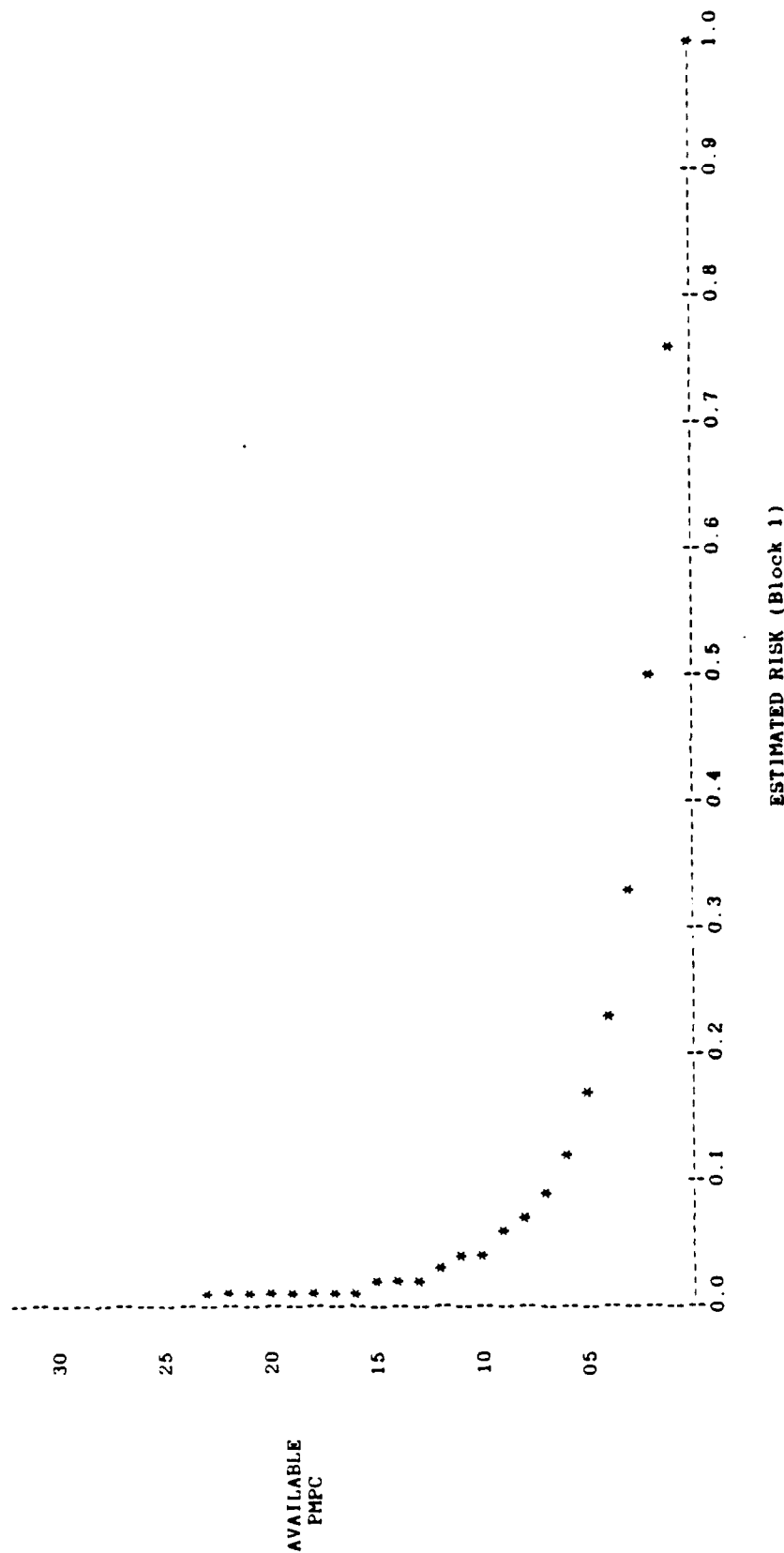
AVAILABLE
PMPC

ESTIMATED RISK (Block 1)

Evaluated Risk: 0.55

Available PMPC: 5.47
Estimated PMPC: 1.98
Estimated Risk: 0.14

Figure B-6. Evaluation Report A5

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EVALUATION REPORT A5: PLOT OF PMPC VS. RISK

```
*******************************************
*                                         *
*            SYSTEM PROFILE               *
*                                         *
* SWSYSID :  82        SWTYPE  : C-E       *
*                                         *
* SYSTEM  : F-16       SUPPORTER: WR-ALC   *
*                                         *
* SWSYSTEM : COMNET TERMINAL    USER : HQ-TAC *
*                                         *
*******************************************
```


ESTIMATED RISK (Block 2)
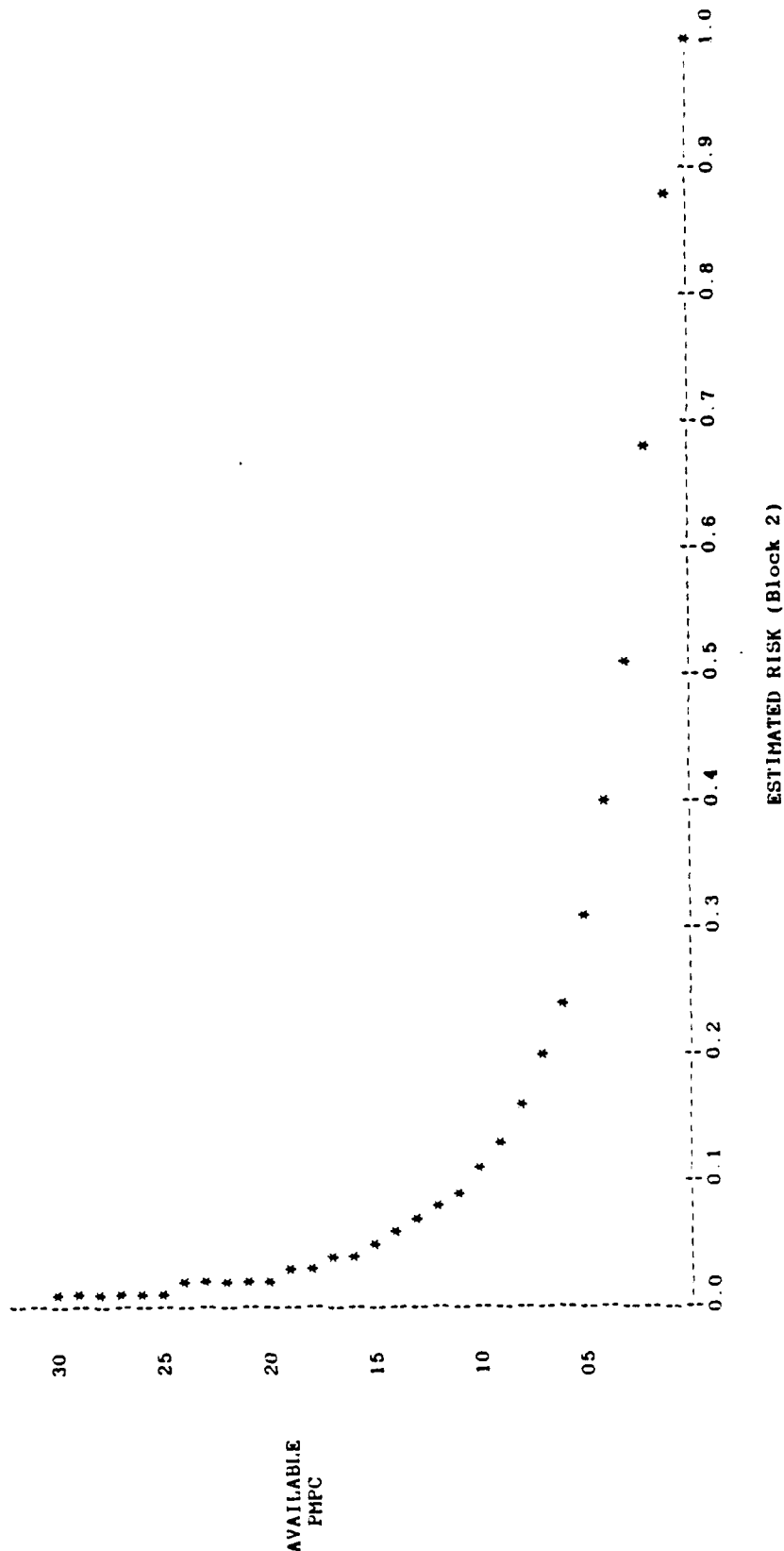
Evaluated Risk: 0.55

Available PMPC: 3.29
Estimated PMPC: 3.11
Estimated Risk: 0.48

Figure B-6. Evaluation Report A5 (Continued)

EVALUATION REPORT A5: PLOT OF PMPC VS. RISK

```
*********************************************
*            SYSTEM PROFILE                 *
*                                           *
*  SWSYSID : 82          SWTYPE  : C-E       *
*                                           *
*  SYSTEM  : F-16        SUPPORTER: WR-ALC   *
*                                           *
*  SWSYSTEM : COMNET TERMINAL    USER : HQ-TAC *
*********************************************
```

ESTIMATED RISK (Block 3)
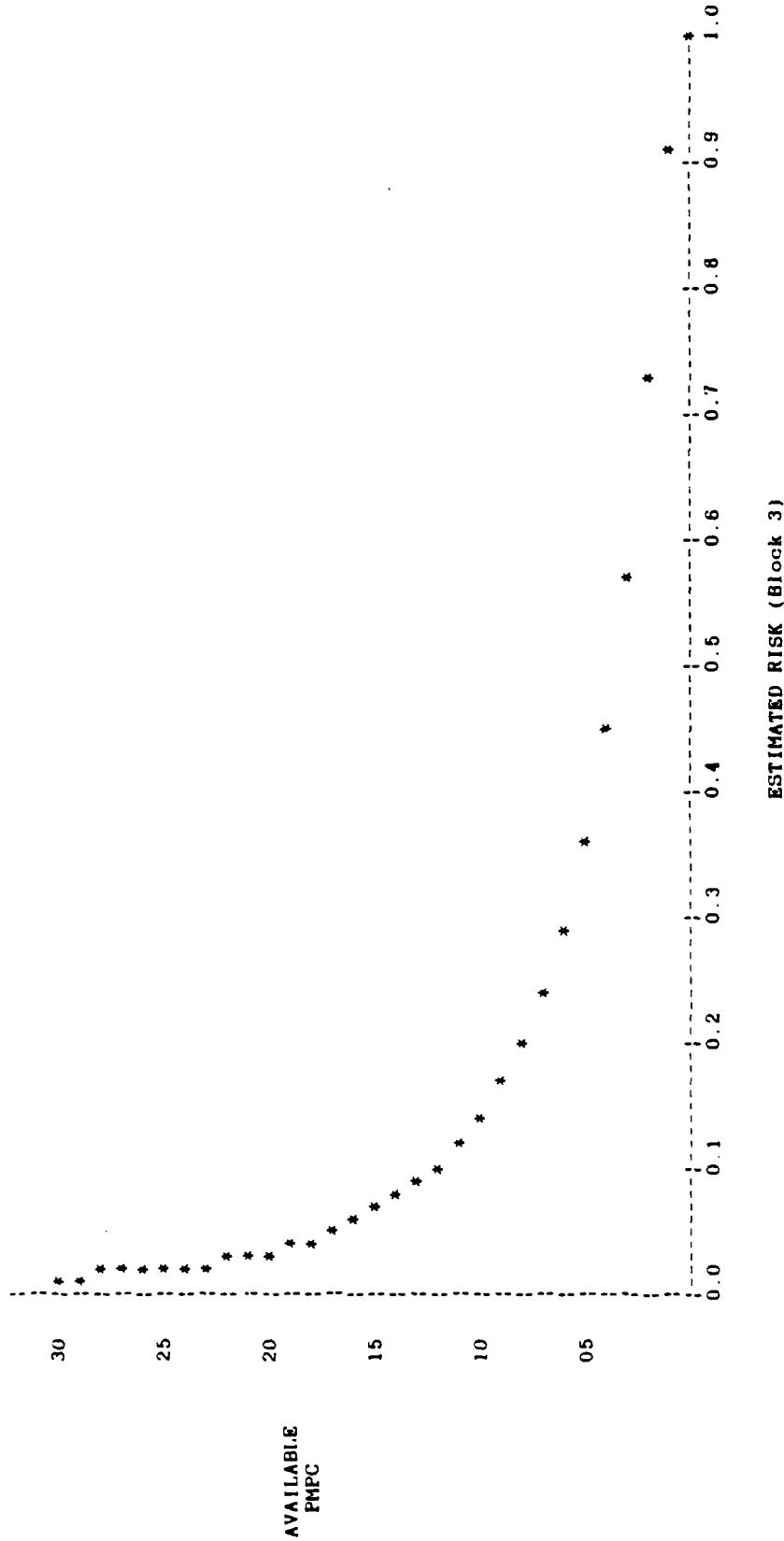
Evaluated Risk: 0.55

Available PMPC: 3.29
Estimated PMPC: 3.57
Estimated Risk: 0.54

Figure B-6. Evaluation Report A5 (Concluded)

03/16/86

B.2.5 Report A5: Plot of PMPC Versus Risk.

Evaluation Report A5 presents a plot of the available person-months per change versus the estimated risk for each block of the baseline change profile. This is accomplished (one block at a time) by computing the estimated risk 30 times - using available person-months per change 1...30, and estimated person-months per change for that block (remains constant throughout the 30 computations).

03/16/86   EVALUATION REPORT A6: SUMMARY OF SOFTWARE SUPPORTABILITY RISK ASSESSMENT

```
************************************
*                                  *
*           SYSTEM PROFILE         *
*                                  *
*  SWSYSID : 82      SWTYPE : C-E   *
*                                  *
*  SYSTEM : F-16    SUPPORTER: WR-ALC *
*                                  *
*  SWSYSTEM : COMNET TERMINAL  USER : HQ TAC *
*                                  *
************************************
```

USER/SUPPORTER BASELINE ESTIMATE:

SUPPORT STAFF: 15 Persons, 19% Dedicated, Avg.Skill level 3.00
               9 Persons, 90% Dedicated, Avg.Skill level 3.00

RELEASE SCHEDULE: 9.00 Month Block Release Cycle with 3.00 Month overlap
BLOCK 1 CHANGE PROFILE: Total(15); Type(15, 0, 0); Complexity(0, 0, 15); Priority(0, 0, 15)
BLOCK 2 CHANGE PROFILE: Total(20); Type(15, 5, 0); Complexity(1, 4, 15); Priority(1, 4, 15)
BLOCK 3 CHANGE PROFILE: Total(20); Type(13, 7, 0); Complexity(1, 6, 13); Priority(1, 6, 13)

MAJOR FACTOR EVALUATION SCORES (THRESHOLD = 3.50, GOAL = 5.00):

                                  SOFTWARE SUPPORTABILTY: 3.80

PROJECT MANAGEMENT: 3.47   LIFE CYCLE PROCESS: 3.32
CONFIGURATION MANAGEMENT   3.17

DOCUMENTATION: 3.97   PRODUCT: 4.15
SOURCE CODE: 4.32

PERSONNEL: 3.53   SUPPORT RESOURCES   3.94
SUPPORT SYSTEMS   3.72
FACILITIES   4.58

MAJOR FACTOR RISK REDUCTION POTENTIAL:

PROJECT MANAGEMENT: 0.21
CONFIGURATION MANAGEMENT: 0.23

DOCUMENTATION: 0.07
SOURCE CODE: 0.06

PERSONNEL: 0.09
SUPPORT SYSTEMS: 0.14
FACILITIES: 0.00

OVERALL RISK ASSESSMENT (THRESHOLD = 0.50, GOAL = 0.20):

ESTIMATED (Block 1): 0.14   LOW
        (Block 2): 0.48   MEDIUM
        (Block 3): 0.54   HIGH

EVALUATED: 0.54   HIGH

Figure B-7. Evaluation Report A6

B.2.6 Report A6: Summary of Software Supportability Risk Assessment.

Evaluation Report A6 is a summary of all data for the selected software system. Included in the report is the following:

(1) USER/SUPPORTER BASELINE ESTIMATE

This section is simply a reiteration of the Support Concept and the Baseline Change Profile that was previously entered.

(2) MAJOR FACTOR EVALUATION SCORES

This section shows the major factor (high level) scores that were computed from the evaluation scores that were previously entered. Included are the Evaluation Metric Boundaries (threshold and goal values). The evaluation scores can be compared against these values to determine whether they are high, medium, or low.

(3) MAJOR FACTOR RISK REDUCTION POTENTIAL

This section shows the potential for each major factor to reduce the software supportability risk. The number given for each factor represents the amount that the risk would be reduced if that factor were set to 6 (maximum score).

(4) OVERALL RISK ASSESSMENT

This section shows the estimated risk for each block (based on User/Supporter estimate) and the evaluated risk (based on the evaluation scores). Included are the Risk Metric Boundaries (threshold and goal values). The risk values can be compared against these values to determine whether they are high, medium, or low.

RAEVAL
SOFTWARE SUPPORTABILITY EVALUATION DATA
SYSTEM ASSESSMENT RATINGS
EVALUATION REPORT D1: PART 1

SYSTEM ID	UPDATE DATE	SUPPORTER	SYSTEM	SOFTWARE SYSTEM	USE FLAG	CONFIDENCE	EVALUATED SCORE	RISK
1	01/22/86	NORAD	CSS	CSS	.T.		0.99	0.56
3	01/22/86	NORAD	MEBU	MEBU	.T.		0.99	0.47
4	01/22/86	NORAD	NCS	NCS	.T.		0.99	0.47
5	01/22/86	NORAD	SSC	SSC	.T.		0.99	0.26
6	01/22/86	WR-ALC	ALR-46	ALR-46	.T.		0.85	0.19
7	01/22/86	WR-ALC	ALR-69	ALR-69	.T.		0.60	0.13
8	03/14/86	WR-ALC	AN/ALQ-131	AGEUP	.F.		0.60	0.84
9	01/22/86	WR-ALC	AN/ALQ-131	BIG	.T.		0.70	0.41
10	01/22/86	WR-ALC	AN/ALQ-131	OFP	.T.		0.70	0.46
11	01/22/86	WR-ALC	AN/ALQ-131	UUT	.T.		0.60	0.65
12	01/22/86	WR-ALC	AFR-38	AFR-38	.T.		0.70	0.27
13	01/22/86	WR-ALC	B-52 EVS AIE	ASQ-151	.T.		0.90	0.13
14	01/22/86	WR-ALC	E-3A AVIONICS ATE	AN/GSM-285(B)	.T.		0.55	0.37
15	01/22/86	WR-ALC	E-3A AVIONICS ATE	AN/GSM-285(W)	.T.		0.80	0.17
16	01/22/86	WR-ALC	F-15	CC	.T.		0.75	0.19
17	01/22/86	WR-ALC	F-15	RADAR	.T.		0.99	0.26
18	01/22/86	WR-ALC	F-15 AVIONICS ATE	ADIS,AIS	.T.		0.80	0.27
19	01/22/86	WR-ALC	JTIDS	ASIT/OCP	.T.		0.99	0.26
20	01/22/86	WR-ALC	JTIDS	E-3A AWACS/OCP	.T.		0.75	0.27
21	01/22/86	WR-ALC	JTIDS	SP/USER	.T.		0.55	0.35
22	01/22/86	WR-ALC	JTIDS	SYS EXERCISER	.T.		0.99	0.75
23	01/22/86	WR-ALC	PAVE TACK	AISF	.T.		0.85	0.10
24	01/22/86	WR-ALC	PAVE TACK	OFP	.T.		0.90	0.09
25	01/22/86	SM-ALC	F-111D	WNC	.T.		0.80	0.23
26	01/22/86	SM-ALC	F-111F	WNC	.T.		0.99	0.23
27	01/22/86	SM-ALC	FB-111A	WNC	.T.		0.80	0.23
28	01/22/86	CASTLE AFB	B-52	CPT	.T.		0.65	0.36
29	01/22/86	CASTLE AFB	B-52	WST	.T.		0.70	0.44
30	01/22/86	CASTLE AFB	KC-135	WST	.T.		0.70	0.42
31	01/22/86	CASTLE AFB	T-4 TRAINER	T-4 SIMULATOR	.T.		0.80	0.29
32	01/22/86	OO-ALC	F-16	FCC	.T.		0.75	0.24
33	01/22/86	OO-ALC	F-16	HUD	.T.		0.40	0.50
34	01/22/86	OO-ALC	F-16	OFT	.T.		0.70	0.20
35	01/22/86	OO-ALC	F-16	FCR	.T.		0.15	0.71
36	01/22/86	OO-ALC	F-4	SMS	.T.		0.80	0.34
37	01/22/86	OO-ALC	F-4	MDIS	.T.		0.70	0.14
38	01/22/86	OO-ALC	F-4E	AN/ARN-101	.T.		0.60	0.33
39	01/22/86	OO-ALC	F-4G	AN/ARN-101	.T.		0.75	0.29
40	01/22/86	OO-ALC	F-4G	LRU-1/ACM	.T.		0.70	0.23
41	01/22/86	OO-ALC	MINUTEMAN	WING II/2015	.T.		0.95	0.23
42	01/22/86	OO-ALC	MINUTEMAN	WING VI/HS-29	.T.		0.95	0.07
43	01/22/86	OO-ALC	MINUTEMAN	WINGS/HS-28	.F.		0.95	0.19
44	01/22/86	OO-ALC	MINUTEMAN II	SSAS/CAFS	.T.		0.20	0.64
45	01/22/86	OO-ALC	MINUTEMAN II	WING V/HEG/RATS	.T.		0.80	0.20
46	01/22/86	OO-ALC	MINUTEMAN II	WING VI/HEG/RATS	.T.		0.90	0.26
47	01/22/86	OO-ALC	KF-4C	AN/ARN-101	.T.		0.60	0.33
48	01/22/86	OC-ALC	ALCM	LII	.T.		1.00	0.08
49	01/22/86	OC-ALC	ALCM	LPT	.T.		0.85	0.12
50	01/22/86	OC-ALC	ALCM	OFP	.T.		0.55	0.45

Figure B-8.   Evaluation Report D1

RAEVAL

SOFTWARE SUPPORTABILITY EVALUATION DATA
SYSTEM ASSESSMENT RATINGS
EVALUATION REPORT D1: PART 2

SYSTEM ID	AFDOC	AFDOC MOD	AFDOC DES	AFDOC CON	AFDOC SIM	AFDOC EXP	AFDOC INS	AFSRC	AFSRC MOD	AFSRC DES	AFSRC CON	AFSRC SIM	AFSRC EXP	AFSRC INS	AFRODUCT
1	3.38	4.00	3.25	3.00	4.00	2.75	3.25	3.33	2.50	4.25	4.00	2.25	4.00	3.00	3.35
3	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
4	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.25
5	4.54	4.75	4.75	4.75	4.75	4.50	3.75	4.00	4.25	4.00	4.25	3.75	4.00	3.75	4.27
6	4.69	4.75	5.00	4.50	4.70	4.25	4.95	4.18	3.00	4.40	4.40	3.75	4.80	3.75	4.44
7	4.71	3.75	5.00	4.50	4.50	5.00	5.50	4.25	4.75	4.50	4.50	4.50	2.25	5.00	4.48
8	4.00	3.00	4.00	5.00	4.00	3.00	5.00	2.83	2.00	3.00	4.00	3.00	2.00	3.00	3.42
9	2.83	1.50	2.50	2.00	5.00	1.00	5.00	2.83	1.50	3.00	3.00	2.50	2.00	5.00	2.83
10	4.17	2.00	5.00	5.00	5.00	4.50	5.50	4.17	2.00	4.00	4.50	4.50	1.50	5.50	4.17
11	2.42	2.50	4.50	2.50	5.00	1.50	1.00	2.67	3.00	4.00	2.50	2.50	3.50	2.50	2.54
12	5.21	5.00	4.75	6.00	3.50	6.00	6.00	4.62	4.25	4.50	6.00	3.50	3.50	6.00	4.92
13	5.17	5.75	4.75	5.50	5.25	5.25	4.50	4.42	3.75	4.50	3.55	4.50	5.50	4.75	4.79
14	3.58	2.50	4.00	4.00	3.00	4.00	4.00	3.58	2.50	4.00	4.00	3.00	4.00	4.00	3.58
15	4.62	4.00	4.00	4.50	4.75	5.50	4.00	4.96	5.50	5.50	4.50	4.75	5.50	4.00	4.79
16	4.67	4.50	4.50	5.50	4.00	4.50	4.50	4.96	5.00	5.25	5.50	4.50	5.50	4.00	4.82
17	5.54	5.25	5.25	5.75	5.25	6.00	5.50	5.88	6.00	5.75	6.00	5.50	6.00	6.00	5.71
18	4.42	4.50	4.50	5.50	5.00	4.00	3.00	4.00	4.50	3.25	3.25	4.25	4.25	4.50	4.21
19	5.04	5.00	5.00	5.00	5.00	5.00	5.25	5.04	5.25	5.00	5.00	5.00	5.00	5.00	5.04
20	5.04	5.00	5.00	5.00	5.00	5.00	5.25	5.04	5.25	5.00	5.00	5.00	5.00	5.00	5.04
21	4.08	5.00	3.50	5.00	3.00	5.00	3.00	3.83	5.00	3.50	3.00	3.00	3.50	3.00	3.96
22	2.90	2.50	2.50	3.00	3.00	3.50	5.00	2.90	2.50	2.50	2.50	3.00	3.50	3.00	2.90
23	5.33	5.25	5.25	5.25	5.50	5.50	5.25	5.50	5.75	5.50	5.75	5.00	5.50	5.50	5.42
24	5.46	5.75	5.50	5.25	5.25	5.50	5.50	5.42	5.60	5.50	5.40	5.00	5.75	5.25	5.44
25	5.00	4.75	4.75	5.00	5.00	5.50	0.00	4.00	5.00	4.00	4.00	2.50	4.50	0.00	4.50
26	5.00	4.75	4.75	5.00	5.00	5.50	0.00	4.00	5.00	4.00	4.00	2.50	4.50	0.00	4.50
27	5.00	4.75	4.75	5.00	5.00	5.50	0.00	4.00	5.00	4.00	4.00	2.50	4.50	0.00	4.50
28	3.58	4.50	3.75	3.75	4.00	4.50	1.00	3.38	4.50	3.25	3.75	3.25	4.50	1.00	3.48
29	3.29	4.50	3.75	2.50	2.50	3.00	3.50	3.35	4.00	2.50	2.50	3.75	4.00	0.00	3.32
30	3.29	4.50	3.75	2.50	2.50	3.00	3.50	3.35	4.00	2.50	2.50	3.75	4.00	0.00	3.32
31	3.46	3.75	4.00	4.75	4.00	3.25	1.00	3.04	3.00	3.00	4.00	3.25	3.00	1.00	3.25
32	3.46	4.75	4.00	4.50	4.00	5.00	4.50	4.62	5.00	4.75	4.50	4.50	4.50	4.50	4.58
33	4.08	5.00	4.00	3.75	4.00	4.00	3.75	3.67	5.00	4.50	4.00	2.50	3.00	3.00	3.88
34	4.38	5.50	2.50	4.25	3.75	5.75	4.50	4.12	5.50	2.73	3.75	4.50	3.75	4.50	4.25
35	2.42	3.00	1.50	1.50	2.00	4.00	2.50	2.08	3.00	1.50	2.00	2.50	2.00	1.50	2.25
36	4.42	4.00	4.50	4.50	4.50	4.50	4.50	4.42	4.00	4.50	4.50	4.50	4.30	4.50	4.42
37	3.83	5.00	4.00	5.00	3.00	5.00	4.00	4.17	5.00	3.00	5.00	3.00	3.00	4.50	4.29
38	4.50	4.50	3.00	5.25	1.50	4.75	3.00	3.75	4.50	5.50	4.50	1.25	4.75	4.50	3.79
39	5.00	5.25	5.00	5.50	5.25	3.00	0.00	4.79	4.85	4.75	4.75	4.75	4.25	4.75	4.65
40	4.42	5.25	4.75	5.25	4.75	5.50	0.00	4.64	5.00	4.00	4.50	4.00	5.00	4.00	4.82
41	5.50	4.75	4.25	5.25	4.25	4.25	0.00	4.71	4.75	4.75	4.50	4.75	5.50	6.00	4.57
42	4.62	4.75	4.25	5.50	4.50	5.50	0.00	4.58	4.75	4.00	4.75	4.50	5.50	4.00	4.60
43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	3.80	5.00	5.00	5.50	2.50	1.00	0.00	4.20	5.50	6.00	6.00	2.50	1.00	4.00	4.00
45	4.60	5.50	5.50	5.50	4.50	2.00	0.00	4.00	5.50	5.50	6.00	2.00	1.00	6.00	4.30
46	3.75	4.00	2.50	4.00	4.00	5.00	4.00	4.00	3.00	3.00	5.00	4.00	3.00	4.00	3.88
47	5.58	6.00	6.00	5.75	5.50	5.50	5.00	5.92	6.00	6.00	5.75	5.75	6.00	6.00	5.75
48	5.38	5.50	5.50	5.00	5.50	5.25	5.50	4.96	5.50	4.75	5.00	5.00	4.75	4.75	5.17
50	4.29	4.00	4.50	4.75	4.75	3.00	4.75	4.92	4.25	5.50	5.00	5.25	4.75	4.75	4.61

Figure B-8. Evaluation Report D1 (Continued)

RAEVAL

SOFTWARE SUPPORTABILITY EVALUATION DATA
SYSTEM ASSESSMENT RATINGS
EVALUATION REPORT D1: PART 3

SYSTEM ID	AEPER	AEPER MAN	AEPER TEC	AEPER SUP	AEPER CON	AESYS	AESYS HOS	AESYS BEN	AESYS LAB	AESYS OFE	AESYS CMS	AESYS OTH	AEFAC	AEFAC OFF	AEFAC ENV	AENVIRON
1	4.38	4.50	4.50	4.00	4.50	3.00	2.00	2.00	2.00	6.00	0.00	0.00	4.25	4.00	4.50	3.88
3	3.50	4.00	4.00	2.50	0.00	2.50	2.50	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	3.00
4	3.67	4.00	4.50	2.50	0.00	3.50	2.00	0.00	0.00	0.00	0.00	5.00	3.50	3.00	4.00	3.56
5	4.38	4.75	4.25	4.25	4.25	4.75	4.75	0.00	0.00	4.75	0.00	0.00	4.38	4.75	4.00	4.50
6	4.25	4.00	4.50	4.25	0.00	5.31	5.25	5.50	5.50	5.00	0.00	0.00	4.38	4.00	4.75	4.65
7	5.17	5.50	5.25	4.75	0.00	5.44	5.50	5.75	5.50	5.00	0.00	0.00	5.75	6.00	5.50	5.45
8	2.25	1.00	2.00	3.00	3.00	2.50	2.00	3.00	4.00	3.00	2.00	1.00	3.00	3.00	3.00	2.58
9	3.62	4.00	4.00	2.50	4.00	5.25	5.00	5.50	5.00	0.00	0.00	5.50	4.50	3.00	6.00	4.46
10	3.62	4.00	4.00	2.50	3.00	4.94	4.50	4.50	5.50	0.00	0.00	5.25	4.50	3.00	6.00	4.35
11	2.38	4.00	1.00	1.50	3.00	2.38	3.00	3.00	1.50	0.00	0.00	2.00	3.75	3.00	4.50	2.84
12	4.67	4.75	4.50	4.75	0.00	4.44	3.50	4.75	4.75	4.75	0.00	0.00	4.00	3.50	4.50	4.37
13	4.88	5.50	4.50	4.00	4.50	5.17	5.00	5.50	0.00	5.00	0.00	0.00	5.00	5.00	5.00	5.02
14	5.25	4.75	5.50	5.50	5.00	4.62	4.50	3.75	5.75	4.50	0.00	0.00	4.62	4.00	5.25	4.83
15	5.25	4.75	5.50	5.50	0.00	4.65	4.50	3.75	5.75	4.50	0.00	4.75	4.62	5.50	5.25	4.84
16	4.25	4.00	4.50	4.50	4.00	5.38	5.50	5.00	5.50	5.50	0.00	0.00	5.75	5.50	6.00	5.13
17	4.62	3.50	4.00	5.25	5.75	4.65	5.25	5.25	3.50	6.00	0.00	1.25	5.75	5.50	6.00	5.01
18	4.33	4.50	4.00	4.50	0.00	4.06	4.00	4.50	3.75	4.00	0.00	0.00	3.50	2.50	4.50	3.96
19	4.38	4.75	4.50	4.25	4.00	4.10	4.00	3.75	4.75	4.50	0.00	3.50	4.95	4.90	5.00	4.48
20	4.31	4.50	4.50	4.25	4.00	3.70	4.00	3.25	3.75	4.50	0.00	3.00	5.00	5.00	5.00	4.34
21	4.25	0.00	4.25	0.00	0.00	3.25	3.25	0.00	0.00	0.00	0.00	0.00	3.75	3.75	3.75	3.75
22	4.75	0.00	4.75	0.00	0.00	2.50	2.50	0.00	0.00	0.00	0.00	0.00	3.50	3.50	3.50	3.58
23	5.06	5.00	4.50	5.50	5.50	5.35	5.75	5.75	4.75	5.00	0.00	5.50	5.62	5.50	5.75	5.34
24	5.08	5.05	5.00	4.75	5.50	5.23	5.40	5.00	5.10	5.40	0.00	5.25	5.80	6.00	5.60	5.37
25	5.00	4.50	5.50	5.00	5.00	4.62	4.50	4.50	5.00	4.50	0.00	0.00	4.00	4.00	4.00	4.54
26	5.00	4.50	5.50	5.00	5.00	4.62	4.50	4.50	5.00	4.50	0.00	0.00	4.00	4.00	4.00	4.54
27	5.00	4.50	5.50	5.00	5.00	4.62	4.50	4.50	5.00	4.50	0.00	0.00	4.00	4.00	4.00	4.54
28	4.25	5.00	4.00	5.00	2.00	4.88	3.75	0.00	0.00	6.00	0.00	0.00	3.88	4.00	3.75	4.34
29	4.12	4.50	4.50	4.00	4.00	4.40	4.50	4.00	5.00	6.00	0.00	3.75	3.88	3.75	4.00	4.34
30	4.25	4.50	4.50	4.00	4.00	4.56	4.50	4.00	0.00	6.00	0.00	3.75	3.88	3.75	4.00	4.23
31	4.94	5.00	5.00	5.00	4.75	5.50	5.00	5.00	5.00	5.00	0.00	0.00	4.50	4.50	4.50	4.98
32	3.62	3.50	3.00	3.50	4.50	5.00	5.00	5.00	5.00	5.00	0.00	0.00	2.75	2.00	3.50	3.79
33	2.38	2.50	2.00	2.50	2.50	4.50	5.00	5.00	3.00	5.00	0.00	0.00	2.25	2.00	2.50	3.04
34	4.17	2.50	5.50	4.75	0.00	5.17	5.00	5.00	5.00	6.00	0.00	4.50	5.75	5.75	5.75	5.03
35	2.00	3.50	2.00	1.50	1.00	4.38	4.50	6.00	2.00	5.00	0.00	0.00	2.00	2.00	2.00	2.79
36	3.25	4.00	3.00	4.00	2.00	3.88	3.00	3.50	4.50	4.50	0.00	0.00	2.75	2.00	3.50	3.29
37	5.56	5.75	5.50	5.50	5.50	4.62	4.00	4.50	5.00	5.00	0.00	0.00	5.00	4.50	5.50	5.06
38	5.31	5.50	5.50	4.75	5.50	3.94	3.75	3.25	4.00	4.75	0.00	0.00	4.88	5.25	4.50	4.71
39	4.17	0.00	3.25	4.50	4.75	3.00	3.00	3.00	0.00	0.00	0.00	0.00	5.25	5.00	5.50	4.14
40	4.67	4.75	4.75	4.50	0.00	4.69	4.50	5.00	4.25	5.00	0.00	0.00	4.62	4.50	4.75	4.66
41	5.44	4.75	5.50	5.75	5.75	5.56	5.50	5.50	5.50	5.75	0.00	0.00	3.38	1.50	5.25	4.79
42	5.50	4.75	5.75	5.75	5.75	5.56	5.25	5.75	5.50	5.75	0.00	0.00	3.38	1.50	5.25	4.81
43	5.44	4.75	5.50	5.75	5.75	5.56	5.50	5.50	0.00	5.50	0.00	0.00	3.38	1.50	5.25	4.79
44	5.00	5.00	5.50	4.50	4.50	3.00	3.00	0.00	2.00	4.00	0.00	0.00	5.50	5.50	5.50	4.50
45	4.75	4.50	4.50	5.25	5.00	4.33	4.50	4.50	4.00	4.50	0.00	0.00	5.50	5.50	5.50	4.86
46	4.83	5.00	4.50	4.75	5.50	4.33	5.50	2.00	0.00	5.50	0.00	0.00	5.50	5.50	5.50	4.89
47	5.00	4.50	5.00	5.25	5.50	3.17	2.50	0.00	3.00	4.00	0.00	0.00	2.00	2.00	2.00	3.39
48	5.56	5.50	5.75	5.75	5.75	5.62	6.00	5.50	5.50	5.50	0.00	0.00	5.50	5.50	5.50	5.56
49	5.12	5.25	5.25	4.75	5.25	5.50	5.50	5.50	5.50	5.50	0.00	0.00	5.25	5.00	5.50	5.29
50	2.88	1.00	4.75	1.00	4.75	3.94	4.00	3.75	4.00	5.00	0.00	0.00	3.75	3.25	4.25	3.52

Figure B-8.   Evaluation Report D1 (Continued)

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RAEVAL

SOFTWARE SUPPORTABILITY EVALUATION DATA
SYSTEM ASSESSMENT RATINGS
EVALUATION REPORT D1 : PART 4

SYSTEM ID	AMCON	AMCON IDE	AMCON STA	AMCON CUN	AMCON AUD	AMMAI	AMMAI FLA	AMMAI ORG	AMMAI DES	AMMAI COD	AMMAI TES	AMMAI INI	AMANAGE	ASUPPORT
1	3.19	5.00	2.00	4.25	1.50	4.12	4.50	4.50	4.75	4.00	4.50	2.50	3.66	3.63
3	5.00	5.00	5.00	5.00	5.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	4.00	3.83
4	4.50	4.50	4.50	4.50	4.50	3.00	3.00	3.00	3.00	4.50	3.00	3.00	3.75	3.85
5	4.56	4.75	4.75	4.75	4.00	4.50	4.50	5.00	4.75	4.50	4.50	4.00	4.53	4.43
6	4.50	4.50	4.50	4.50	4.50	5.15	5.00	5.25	5.25	5.40	5.00	5.00	4.83	4.64
7	5.31	5.50	5.00	5.75	5.00	5.38	5.50	5.25	5.00	5.50	5.50	5.50	5.34	5.09
8	1.50	1.00	1.00	2.00	2.00	2.83	3.00	2.00	4.00	3.00	2.00	3.00	2.17	2.72
9	4.38	2.50	5.00	4.00	6.00	3.92	4.50	2.00	4.00	5.00	5.00	4.00	4.15	3.81
10	2.93	3.20	2.96	4.08	1.48	3.81	2.04	2.44	3.48	5.00	5.48	5.48	3.37	3.96
11	4.38	2.50	5.00	4.00	6.00	3.92	4.50	4.44	4.00	5.00	5.00	4.00	4.15	3.18
12	4.30	4.50	0.00	4.50	3.90	4.06	4.00	3.55	4.00	4.00	5.00	4.00	4.18	4.49
13	5.67	5.50	0.00	5.75	5.75	4.90	4.75	4.75	0.00	4.75	4.75	0.00	5.29	5.03
14	2.81	3.00	4.00	2.25	2.00	5.08	4.50	5.50	5.50	4.50	4.50	5.50	3.95	4.12
15	4.81	4.75	4.75	4.50	5.00	5.08	4.50	4.50	5.50	4.50	4.50	6.00	4.95	4.86
16	4.75	5.00	4.50	5.00	4.50	4.83	5.00	4.50	4.50	4.50	5.00	5.50	4.79	4.91
17	3.50	4.50	3.50	3.50	3.50	4.38	3.50	5.00	5.75	5.00	3.50	3.50	3.94	4.89
18	4.38	4.25	4.50	3.75	5.00	4.96	5.50	4.50	4.75	5.00	5.00	5.00	4.67	4.28
19	4.25	4.25	0.00	4.50	4.00	4.75	5.50	4.75	4.75	4.50	4.50	4.00	4.50	4.67
20	4.31	3.75	4.25	4.50	0.00	4.75	5.50	4.75	4.75	5.00	4.50	4.00	4.53	4.64
21	3.75	3.75	0.00	0.00	0.00	5.42	5.50	5.50	5.50	5.00	5.00	5.50	4.58	4.10
22	1.50	1.50	1.50	1.50	1.50	3.88	0.00	4.00	4.00	3.50	3.50	0.00	2.69	3.06
23	5.75	5.75	5.75	5.75	5.75	5.04	5.00	5.50	5.50	5.25	5.50	4.00	5.40	5.39
24	5.56	5.60	5.50	5.65	5.50	5.40	5.45	5.50	5.50	5.55	5.00	5.00	5.48	5.43
25	4.50	4.50	4.00	5.00	4.50	4.58	4.50	5.00	5.00	5.00	4.00	4.00	4.54	4.53
26	4.50	4.00	5.00	4.50	4.50	4.38	4.50	4.00	5.00	5.00	4.00	4.00	4.54	4.53
27	4.50	5.00	4.00	5.00	4.50	4.58	4.50	4.50	5.00	5.00	4.50	4.00	4.54	4.53
28	4.00	4.00	4.00	4.00	4.00	4.21	4.25	4.25	4.25	4.00	4.00	4.25	4.11	3.98
29	3.88	4.00	3.75	4.00	3.75	3.96	4.00	3.75	3.75	4.00	4.00	4.00	3.92	3.79
30	3.88	4.00	3.75	4.00	3.75	3.96	4.00	3.75	3.75	4.00	4.00	4.00	3.92	3.82
31	4.50	4.50	4.50	4.50	4.50	4.21	4.25	4.25	4.25	4.00	4.25	4.25	4.36	4.20
32	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.29
33	2.88	2.50	3.00	3.00	3.00	4.25	4.00	4.50	4.50	4.00	5.00	3.50	3.56	3.49
34	4.88	4.75	4.75	5.00	4.75	5.08	5.50	4.75	5.25	5.50	5.50	4.00	4.98	4.75
35	3.12	5.00	5.00	1.00	1.50	3.00	2.50	2.50	2.00	2.00	2.00	4.50	3.06	2.70
36	4.38	4.00	4.00	5.50	3.50	4.38	4.50	4.25	4.25	4.50	4.50	4.50	4.38	4.03
37	5.38	5.50	5.00	5.50	5.50	5.38	5.50	5.50	5.50	5.50	5.50	5.00	5.38	4.91
38	4.50	4.50	4.25	4.75	4.50	4.17	4.75	3.75	3.25	4.25	4.25	4.25	4.33	4.28
39	5.25	5.25	5.25	4.50	5.25	4.58	4.75	5.00	5.00	3.25	5.25	5.25	4.92	4.57
40	4.50	4.25	4.75	4.50	4.50	4.46	4.25	4.00	4.00	5.00	4.00	4.00	4.48	4.65
41	3.75	3.75	3.75	4.50	3.75	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.00	4.45
42	5.50	5.50	5.50	5.50	5.50	5.62	5.50	5.75	5.75	5.50	5.75	5.75	5.56	5.29
43	4.00	4.00	4.00	4.00	4.00	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.38	4.59
44	4.50	4.00	4.50	5.00	4.50	4.70	4.00	5.50	5.50	4.50	4.50	0.00	4.60	4.55
45	5.50	5.00	5.50	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.25	4.70
46	5.50	5.00	5.50	5.50	5.50	3.80	4.50	2.00	2.00	5.50	2.00	0.00	4.65	4.61
47	4.88	4.50	5.00	5.00	5.00	4.17	4.50	4.50	4.50	4.00	4.00	4.00	4.53	3.93
48	5.00	5.00	5.00	4.50	4.50	5.46	5.00	5.75	5.75	5.75	5.50	5.50	5.23	5.51
49	4.94	5.50	5.25	4.50	4.50	5.12	5.50	5.50	5.50	4.50	4.50	4.50	5.03	5.16
50	4.00	3.75	4.00	4.25	4.50	3.46	1.50	1.00	4.25	5.25	5.25	3.25	3.73	3.95

Figure B-8. Evaluation Report D1 (Concluded)

B.2.7 Report D1: Table of Evaluation Data.

Evaluation Report D1 is a "dump" of the RAEVAL data base. Because of the large number of fields in the data base, the report is broken down into four parts.

Note: Supporter, System, and Software System are not contained in the RAEVAL data base, but have been included from the RASYSI data base for clarity.

RAKLSE

SOFTWARE MAINTENANCE BLOCK RELEASE SUMMARY DATA
EVALUATION REPORT D2: PART 1

SYSTEM ID	S/W RELEASE SYSTEM ID	UPDATE DATE	SYSTEM	SWSYSTEM	RLS START	RLS END	RLS RELEASE DURATION (MOS.)	RLS RELEASE FIELDED DATE	NUMBER K-LINES SOURCE CODE	% HIGH LEVEL LANG.	PRIMARY LANG.	USEFLAG
1	A	01/22/86	CSS	CSS	03/07/79	02/07/80	11.00	/	350	14	ASSEMBLY	.T.
1	A1	01/22/86	CSS	CSS	08/03/80	10/03/80	2.00	/	350	14	ASSEMBLY	.T.
1	B	01/22/86	CSS	CSS	03/13/80	02/13/81	11.00	/	350	14	ASSEMBLY	.T.
1	C1	01/22/86	CSS	CSS	05/27/80	04/27/81	11.00	/	350	14	ASSEMBLY	.T.
1	D	01/22/86	CSS	CSS	09/03/80	08/03/81	11.00	/	350	14	ASSEMBLY	.T.
1	E	01/22/86	CSS	CSS	12/24/80	11/25/81	11.00	/	350	14	ASSEMBLY	.T.
1	F	01/22/86	CSS	CSS	04/15/81	03/15/82	11.00	/	350	14	ASSEMBLY	.T.
1	G	01/22/86	CSS	CSS	08/30/81	07/30/82	11.00	/	350	14	ASSEMBLY	.T.
1	GH	01/22/86	CSS	CSS	01/15/82	12/15/82	11.00	/	350	14	ASSEMBLY	.T.
1	I	01/22/86	CSS	CSS	06/26/82	05/26/83	11.00	/	350	14	ASSEMBLY	.T.
1	I1	01/22/86	CSS	CSS	05/26/83	07/01/83	1.10	/	350	14	ASSEMBLY	.T.
1	J	01/22/86	CSS	CSS	11/14/82	10/14/83	11.00	/	350	14	ASSEMBLY	.T.
1	K	01/22/86	CSS	CSS	03/29/83	02/29/84	11.00	/	350	14	ASSEMBLY	.T.
1	L	01/22/86	CSS	CSS	09/01/83	08/01/84	11.00	/	350	14	ASSEMBLY	.T.
1	L1	01/22/86	CSS	CSS	08/01/84	09/01/84	1.00	/	350	14	ASSEMBLY	.T.
1	M	01/22/86	CSS	CSS	02/01/84	01/01/85	11.00	/	350	14	ASSEMBLY	.T.
1	N	01/22/86	CSS	CSS	06/01/84	05/01/85	11.00	/	350	14	ASSEMBLY	.T.
2	DCA	01/22/86	MDS	MDS	04/23/78	03/23/79	11.00	/	0	0		.T.
2	DCB	01/22/86	MDS	MDS	02/13/80	01/13/81	11.00	/	0	0		.T.
2	DCC	01/22/86	MDS	MDS	11/22/80	10/22/81	11.00	/	0	0		.T.
2	DCD	01/22/86	MDS	MDS	05/23/81	04/23/82	11.00	/	0	0		.T.
2	DCE	01/22/86	MDS	MDS	11/04/82	10/04/83	11.00	/	0	0		.T.
2	DGA	01/22/86	MDS	MDS	01/01/79	12/01/79	11.00	/	0	0		.T.
2	DGB	01/22/86	MDS	MDS	11/22/80	10/22/81	11.00	/	0	0		.T.
2	DGH1	01/22/86	MDS	MDS	10/22/82	12/14/82	1.80	/	0	0		.T.
2	IFA	01/22/86	MDS	MDS	04/29/78	03/29/79	11.00	/	0	0		.T.
2	IFA1	01/22/86	MDS	MDS	03/29/79	06/01/79	2.00	/	0	0		.T.
2	IFB	01/22/86	MDS	MDS	11/21/79	10/21/80	11.00	/	0	0		.T.
2	IFC	01/22/86	MDS	MDS	08/01/80	07/01/81	11.00	/	0	0		.T.
2	IFC1	01/22/86	MDS	MDS	08/21/80	07/21/81	11.00	/	0	0		.T.
2	IFD	01/22/86	MDS	MDS	11/22/80	10/22/81	11.00	/	0	0		.T.
2	IFD1	01/22/86	MDS	MDS	10/22/81	01/06/82	2.50	/	0	0		.T.
2	IFE	01/22/86	MDS	MDS	05/23/81	04/23/82	11.00	/	0	0		.T.
2	IFF	01/22/86	MDS	MDS	12/15/81	11/15/82	11.00	/	0	0		.T.
2	IFG	01/22/86	MDS	MDS	11/22/80	10/04/83	11.00	/	0	0		.T.
3	B	01/22/86	MENU	MENU	12/30/78	11/30/79	11.00	/	123	76	JOVIAL	.T.
3	C	01/22/86	MENU	MENU	05/10/79	04/10/80	11.00	/	123	76	JOVIAL	.T.
3	C1	01/22/86	MENU	MENU	05/29/80	07/29/80	2.00	/	123	76	JOVIAL	.T.
3	C1A	01/22/86	MENU	MENU	02/06/81	03/05/81	1.00	/	123	76	JOVIAL	.T.
3	C3	01/22/86	MENU	MENU	09/01/80	08/01/81	11.00	/	123	76	JOVIAL	.T.
3	E	01/22/86	MENU	MENU	12/24/80	11/24/81	11.00	/	123	76	JOVIAL	.T.
3	F	01/22/86	MENU	MENU	05/30/81	04/30/82	11.00	/	123	76	JOVIAL	.T.
3	G	01/22/86	MENU	MENU	08/29/81	07/29/82	11.00	/	123	76	JOVIAL	.T.
3	H1	01/22/86	MENU	MENU	01/15/82	12/15/82	11.00	/	123	76	JOVIAL	.T.
3	I	01/22/86	MENU	MENU	08/05/82	07/05/83	11.00	/	123	76	JOVIAL	.T.
3	J	01/22/85	MENU	MENU	11/13/82	10/13/83	11.00	/	123	76	JOVIAL	.T.
3	J1	01/22/85	MENU	MENU	10/13/83	11/07/83	0.80	/	123	76	JOVIAL	.T.
3	J2	01/22/86	MENU	MENU	11/07/83	12/08/83	1.00	/	123	76	JOVIAL	.T.

Figure B-9. Evaluation Report D2

RARLSE

SOFTWARE MAINTENANCE BLOCK RELEASE SUMMARY DATA
EVALUATION REPORT D2: PART 2

SW RLS SYS ID	# PERS. (GROUP1)	AVE. SKILL (GROUP1)	% DED. TO S/W (GROUP1)	% DED. TO RLS (GROUP1)	# PERS. (GROUP2)	AVE. SKILL (GROUP2)	% DED. TO S/W (GROUP2)	% DED. TO RLS (GROUP2)	# PERS. (TOTAL)	AVE. SKILL (TOTAL)	% DED. S/2 (TOTAL)	% DED. TO RLS (TOTAL)	AVAIL. PM	ACTUAL PM
1 A	0	0.00	0.00	0.00	0	0.00	0.00	0.00	71	3.00	1.00	0.55	429.6	0.0
1 A1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	71	3.00	1.00	0.05	7.1	0.0
1 B	0	0.00	0.00	0.00	0	0.00	0.00	0.00	74	3.00	1.00	0.53	431.4	0.0
1 C1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	74	3.00	1.00	0.34	276.8	0.0
1 D	0	0.00	0.00	0.00	0	0.00	0.00	0.00	74	3.00	1.00	0.45	366.3	0.0
1 E	0	0.00	0.00	0.00	0	0.00	0.00	0.00	74	3.00	1.00	0.33	268.6	0.0
1 F	0	0.00	0.00	0.00	0	0.00	0.00	0.00	75	3.00	1.00	0.57	470.2	0.0
1 G	0	0.00	0.00	0.00	0	0.00	0.00	0.00	75	3.00	1.00	0.41	338.2	0.0
1 G1H	0	0.00	0.00	0.00	0	0.00	0.00	0.00	75	3.00	1.00	0.45	371.2	0.0
1 I	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.44	353.3	0.0
1 I1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.05	4.0	0.0
1 J	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.42	337.3	0.0
1 K	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.42	337.3	0.0
1 L	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.45	361.4	0.0
1 L1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.05	3.7	0.0
1 M	0	0.00	0.00	0.00	0	0.00	0.00	0.00	73	3.00	1.00	0.45	361.4	0.0
1 N	0	0.00	0.00	0.00	0	0.00	0.00	0.00	61	3.00	1.00	0.45	301.9	0.0
2 DCA	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.45	39.6	0.0
2 DCB	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.32	35.2	0.0
2 DCC	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.28	30.8	0.0
2 DCD	0	0.00	0.00	0.00	0	0.00	0.00	0.00	9	0.00	1.00	0.05	5.0	0.0
2 DCE	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.05	4.4	0.0
2 DGA	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.82	72.2	0.0
2 DGB	0	0.00	0.00	0.00	0	0.00	0.00	0.00	9	0.00	1.00	0.34	37.4	0.0
2 DGB1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	9	0.00	1.00	0.05	0.8	0.0
2 IFA	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.45	39.6	0.0
2 IFA1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.05	0.8	0.0
2 IFB	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.34	29.9	0.0
2 IFC	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.31	34.1	0.0
2 IFC1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.05	5.5	0.0
2 IFD	0	0.00	0.00	0.00	0	0.00	0.00	0.00	10	0.00	1.00	0.05	5.5	0.0
2 IFD1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	9	0.00	1.00	0.05	1.1	0.0
2 IFE	0	0.00	0.00	0.00	0	0.00	0.00	0.00	9	0.00	1.00	0.32	31.7	0.0
2 IFF	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.70	69.3	0.0
2 IFG	0	0.00	0.00	0.00	0	0.00	0.00	0.00	8	0.00	1.00	0.05	4.4	0.0
3 B	0	0.00	0.00	0.00	0	0.00	0.00	0.00	20	3.00	1.00	0.45	99.0	0.0
3 C	0	0.00	0.00	0.00	0	0.00	0.00	0.00	20	3.00	1.00	0.64	140.8	0.0
3 C1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	20	3.00	1.00	1.00	40.0	0.0
3 C1A	0	0.00	0.00	0.00	0	0.00	0.00	0.00	18	3.00	1.00	0.33	5.9	0.0
3 C3	0	0.00	0.00	0.00	0	0.00	0.00	0.00	18	3.00	1.00	0.64	126.7	0.0
3 E	0	0.00	0.00	0.00	0	0.00	0.00	0.00	18	3.00	1.00	0.41	81.2	0.0
3 F	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.36	67.3	0.0
3 G	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.39	72.9	0.0
3 H1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.42	78.5	0.0
3 I	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.44	82.3	0.0
3 J	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.44	82.3	0.0
3 J1	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.50	6.8	0.0
3 J2	0	0.00	0.00	0.00	0	0.00	0.00	0.00	17	3.00	1.00	0.33	5.6	0.0

Figure B-9. Evaluation Report D2 (Continued)

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RAHLSE

SOFTWARE MAINTENANCE BLOCK RELEASE SUMMARY DATA
EVALUATION REPORT D2; PART 3

SW RLS SYS ID	TOTAL NUMBER OF CHANGES	NUMBER OF TYPE CORRECTION	NUMBER OF TYPE ENHANCEMENT	NUMBER OF TYPE CONVERSION	NUMBER OF TYPE COMPLEXITY LOW	NUMBER OF COMPLEXITY MEDIUM	NUMBER OF COMPLEXITY HIGH	NUMBER OF PRIORITY NORMAL	NUMBER OF PRIORITY URGENT	NUMBER OF PRIORITY EMERGENCY
1 A	75	72	3	0	0	0	0	33	25	17
1 A1	2	1	1	0	0	0	0	0	0	2
1 B	72	65	7	0	0	0	0	15	41	16
1 C1	36	28	8	0	0	0	0	16	12	8
1 D	59	39	20	0	0	0	0	21	29	9
1 E	62	54	8	0	0	0	0	25	28	9
1 F	68	56	12	0	0	0	0	28	30	10
1 G	50	39	11	0	0	0	0	11	30	9
1 G1H	45	30	13	0	0	0	0	12	25	6
1 I	66	54	12	0	0	0	0	29	33	4
1 I1	1	0	1	0	0	0	0	0	1	0
1 J	65	55	10	0	0	0	0	43	17	3
1 K	79	61	18	0	0	0	0	48	24	7
1 L	58	50	8	0	0	0	0	42	16	0
1 L1	1	1	0	0	0	0	0	0	0	1
1 M	65	51	14	0	0	0	0	42	23	0
1 N	35	27	8	0	0	0	0	25	10	1
2 DCA	4	4	0	0	0	0	0	2	1	1
2 DCB	12	9	3	0	0	0	0	10	2	0
2 DCC	3	0	3	0	0	0	0	3	0	0
2 DCD	2	1	1	0	0	0	0	2	0	0
2 DCE	1	0	1	0	0	0	0	1	0	0
2 DGA	6	1	5	0	0	0	0	6	0	0
2 DAB	6	0	6	0	0	0	0	5	1	0
2 DGB1	2	2	0	0	0	0	0	0	0	2
2 IFA	20	20	0	0	0	0	0	15	3	2
2 IFA1	1	1	0	0	0	0	0	0	0	1
2 IFB	16	9	7	0	0	0	0	10	6	0
2 IFC	12	3	9	0	0	0	0	10	2	0
2 IFC1	1	1	0	0	0	0	0	1	0	0
2 IFD	2	0	2	0	0	0	0	1	1	0
2 IFD1	1	1	0	0	0	0	0	1	0	0
2 IIE	7	6	1	0	0	0	0	4	3	0
2 IFF	7	3	4	0	0	0	0	5	2	0
2 IFG	2	0	2	0	0	0	0	2	0	0
3 B	96	74	22	0	0	0	0	27	58	11
3 C	26	14	12	0	0	0	0	8	17	1
3 C1	4	2	2	0	0	0	0	0	4	0
3 C1A	2	0	2	0	0	0	0	0	2	0
3 C3	104	81	23	0	0	0	0	17	83	4
3 E	40	34	6	0	0	0	0	15	25	0
3 F	42	36	6	0	0	0	0	16	24	2
3 G	13	10	3	0	0	0	0	1	11	1
3 H1	40	28	12	0	0	0	0	9	30	1
3 I-1	36	24	12	0	0	0	0	8	28	0
3 J1	41	29	12	0	0	0	0	11	30	0
3 J2	1	1	1	0	0	0	0	0	1	1

Figure B-9.   Evaluation Report D2 (Concluded)

B.2.8 Report D2: Table of Maintenance Release Data.

Evaluation Report D2 is a "dump" of the RARLSE data base. Because of the large number of fields in the data base, the report is broken down into three parts.

Note: SYSTEM and SWSYSTEM are not contained in the RARLSE data base, but have been included from the RASYSI data base for clarity.

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EVALUATION REPORT D3: TABLE OF RISK REGRESSION DATA

EVALUATED SOFTWARE SUPPORTABILITY
RISK REGRESSION COEFFICIENTS

F1 = FACTOR 1 - LIFE CYCLE PROCESS COEFFICIENT: -0.66174

F2 = FACTOR 2 - PRODUCT COEFFICIENT   : -0.29131

F3 = FACTOR 3 - PERSONNEL COEFFICIENT   : -0.15600

F4 = FACTOR 4 - SUPPORT SYSTEMS COEFFICIENT : -0.25120

F5 = FACTOR 5 - FACILITIES COEFFICIENT   : 0.04294

C0 = INTERCEPT (CONSTANT TERM)   : 4.90401

The coefficients listed above are used to calculate the evaluated
software supportability risk from the software supportability
evaluation scores. The following equations are used:

(1) $L = C0 + (F1 * X1) + (F2 * X2) + (F3 * X3) + (F4 * X4) + (F5 * X5)$

Where   X1: Life Cycle Process factor score
        X2: Product factor score
        X3: Personnel factor score
        X4: Support Systems factor score
        X5: Facilities factor score

(2) $RISK = (1 / (1 + \exp(-L)) - (A / 2)) / (1 - A)$

Where   L: Computed from (1) above
        A: 0.02

Figure B-10. Evaluation Report D3

B.2.9 Report D3: Table of Risk Regression Data.

The Table of Risk Regression Data reports the current values of the evaluated risk regression coefficients. Also included in the report are the equations used to compute evaluated risk.

EVALUATION REPORT D4: TABLE OF PMPC REGRESSION DATA

ESTIMATED PERSON-MONTHS PER CHANGE
REGRESSION COEFFICIENTS

F1 = FACTOR 1 - AVERAGE SKILL COEFFICIENT : 0.54837

F2 = FACTOR 2 - % TYPE CORRECTION COEFFICIENT : -0.02848

F3 = FACTOR 3 - % COMPLEXITY LOW COEFFICIENT : 0.21815

F4 = FACTOR 4 - % COMPLEXITY HIGH COEFFICIENT : 2.09568

F5 = FACTOR 5 - % PRIORITY NORMAL COEFFICIENT : -1.57228

F6 = FACTOR 6 - S/W SYSTEM TYPE COEFFICIENT

a) ATD : -0.50845

b) ATE : 0.14413

c) C-E : 0.36255

d) EW : 0.85802

e) OFP : 0.04114

f) Other : 0.00000

C0 = INTERCEPT (CONSTANT TERM) : 0.07083

The coefficients listed above are used to calculate the estimated
person-months per change from the User/Supporter estimate values.
The following equations are used:

(1) $L = C0 + (F1 * X1) + (F2 * X2) + (F3 * X3) + (F4 * X4) + (F5 * X5) + (F6 * X6)$

Where   X1: Average skill of personnel

X2: % of changes that are type correction

X3: % of changes that are complexity low

X4: % of changes that are complexity high

X5: % of changes that are priority normal

X6: 1.00

(2) $PMPC = \exp(L)$

Where   L: Computed from (1) above

Figure B-11. Evaluation Report D4

B.2.10 Report D4: Table of PMPC Regression Data.

The Table of PMPC Regression Data reports the current values of the estimated person-months per change regression coefficients. Also included in the report are the equations used to compute estimated person-months per change.

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EVALUATION REPORT D5: TABLE OF AFOTEC PARAMETERS

EVALUATION METRIC BOUNDARIES

GOAL   : 5.00

THRESHOLD: 3.50

The parameters listed above can be used to compare against
results in output reports to discriminate between evaluation
values which are high, medium, or low.

HIGH   >= GOAL
MEDIUM < GOAL and >= THRESHOLD
LOW   < THRESHOLD

RISK METRIC BOUNDARIES

GOAL   : 0.20

THRESHOLD: 0.50

The parameters listed above can be used to compare against
results in output reports to discriminate between risk values
which are high, medium, or low.

HIGH   > THRESHOLD
MEDIUM <= THRESHOLD and > GOAL
LOW   <= GOAL

Figure B-12. Evaluation Report D5.

B.2.11 Report D5: Table of AFOTEC Parameters.

The Table of AFOTEC Parameters reports the current values of the evaluation metric boundaries (goal and threshold) and the risk metric boundaries (goal and threshold). These values can be used to compare against results in output reports to discriminate against evaluation or risk values that are high, medium, or low.

C. Example BMDP Reports

APPENDIX C

EXAMPLE BMDP RAMSS REPORTS

C.1 INTRODUCTION.

a. The BMDP RAMSS Reports can be printed after executing BMDP programs which read ASCII files of data built from either the data base of evaluation scores or the data base of maintenance release data. This process of generating the proper ASCII files from a dBASE III program is described in section 5.2 and appendix B. The ASCII file of evaluation scores (one record per software system) is named RAASCIIE.DAT. The ASCII file of maintenance release data (one record per software system release) is named RAASCIIM.DAT.

b. The DOS batch file that prints the BMDP RAMSS reports is PRT. To print the reports generated from analysis of evaluation data, enter "PRT EVAL" from the C> prompt. To print the reports generated from analysis of maintenance release data, enter "PRT MAINT" from the C> prompt. See section 5.3 for complete details for printing the BMDP RAMSS reports.

c. A graphic view of the flow process to generate BMDP reports is shown in figure C-1.

C.2 BMDP RAMSS REPORTS.

This section presents excerpts from an example of each BMDP RAMSS report along with appropriate explanation of the printed output. In the sections below, page numbers will be referred to; these appear in the upper left- or right-hand corners of the output pages in the form "PAGE 1". On page 1 of every example output appears the BMDP program control information that produced the output. The program control information starts with "/PROB" and ends
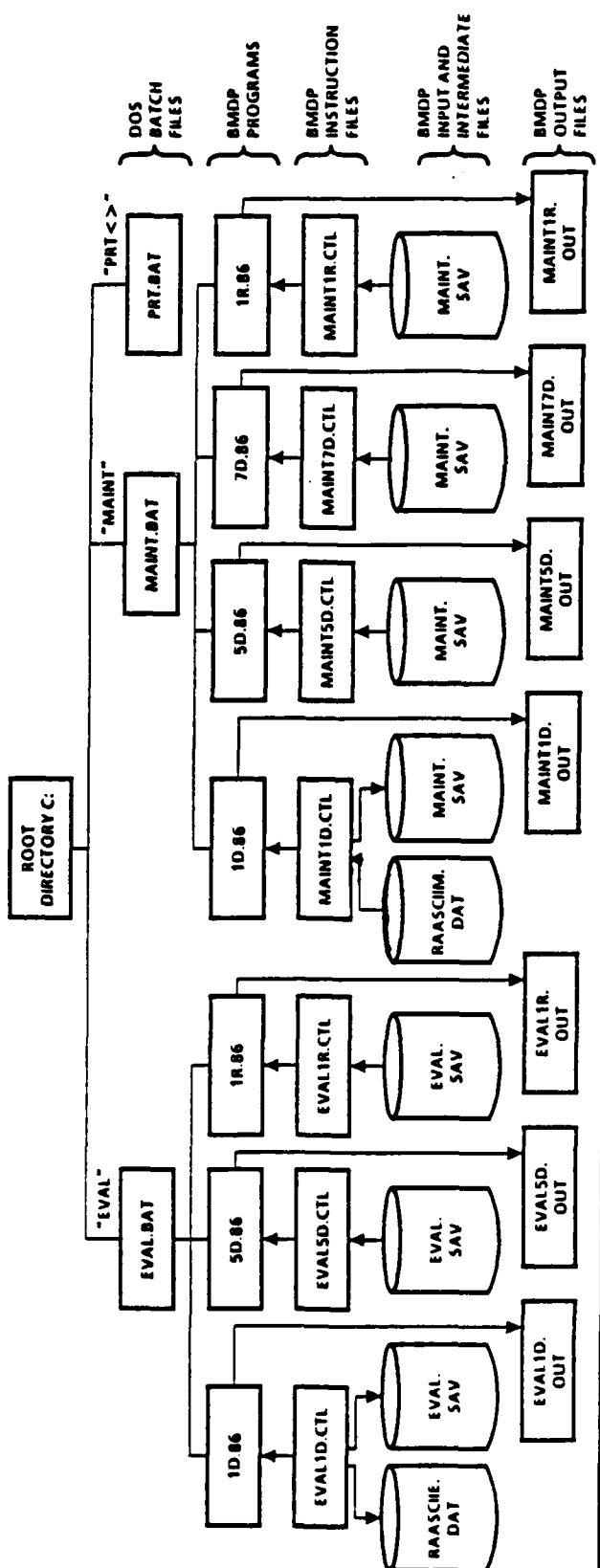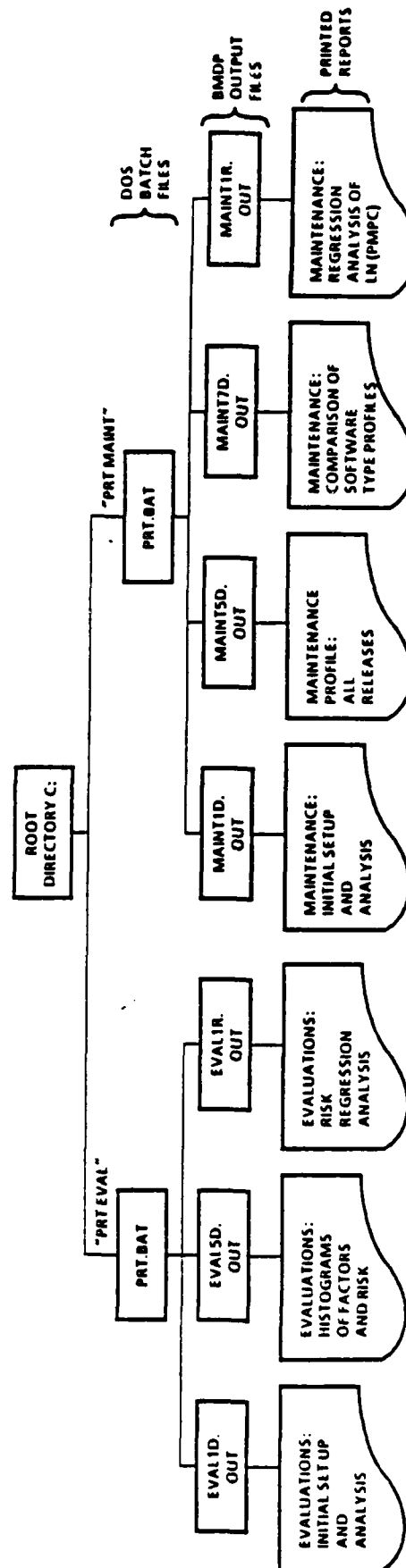
Figure C-1. Hierarchy of RAMSS BMDP Report Generation

with "/END". For details on the control information, refer to the
section for a given program (e.g., 1D) in the BMDP Statistical Soft-
ware manual.

C.2.1 Evaluation Report B1 (See Figure C-2).

a. This output is produced by the control file EVAL1D.CTL, which
primarily reads the ASCII data file RAASCIIE.DAT and sets up a
so-called SAVE file which becomes the data file used for analysis.
Initial variables are read, labelled, and checked for valid values.
Additional variables are computed and stored in the SAVE file. The
SAVE file is named EVAL.SAV. Pages 1 and 2 of the output document
the setup process.

b. On page 3 begins a table of the data stored in the SAVE file.
The "MISSING" entries denote data elements for which missing data
codes occurred in the RAMSS data base. The case labels are actually
software system identification numbers (SWSYSID).

c. A table of summary statistics (mean, standard deviation, etc.)
for the data appears on page 7. The total frequency column indicates
the number of cases (records) for which valid values of the corre-
sponding variable were available.

PAGE   1   BMDP1D

```
BMDP1D - SIMPLE DATA DESCRIPTION AND DATA MANAGEMENT
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD. SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR PC VERSION MAY 1984
MANUAL REVISED -- 1983
COPYRIGHT (C) 1983 REGENTS OF UNIVERSITY OF CALIFORNIA

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86          AT 15:11:04

PROGRAM CONTROL INFORMATION

/PROB   TITLE='EVALUATIONS;  INITIAL SETUP AND ANALYSIS'.
/INPUT  VAR=13.  FILE='\DBASEIII\RAMSS\RAASCIIE.DAT'.
        FORM='(A3,12F4.2)'.
/VAR    NAME=SWSYSID,AFDOC,APSRC,AFRODUCT,AEFER,
        AESYS,AEFAC,AENVIRON,AMCON,AMMA1,
        AMANAGE,ASUPPORI,ACONFID,RISK,LRISK.
        LABEL=SWSYSID.
        MISS=(2)11*0,9.99.
        MIN=(2)11*1,0.
        MAX=(2)11*6,1.
        ADD=2.
/TRAN   RISI=1-ACONFID.
        IF (RISI LE 0 OR RISI GE 1) THEN USE=0.
        *ABOVE LINE PREVENTS THE USE OF CASES FOR
        *WHICH RISK EQUALS ZERO OR ONE.
        A=.02.
        1=RISI*(1-A)+A/2.
        LRISK=LN(T/(1-T)).
/PRINT DATA.
/SAVE   CODE=EVAL.  FILE='\BMDP\RAMSS\EVAL.SAV'.  NEW.
/END

***** TRAN   PARAGRAPH IS USED *****

TEMPORARY NAMES USED IN TRAN       PARAGRAPH
     A                              T
```

Figure C-2.   Evaluation Report B1

THE BDM CORPORATION

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PAGE 2 BMDPID EVALUATIONS: INITIAL SETUP AND ANALYSIS

PROBLEM TITLE IS
EVALUATIONS: INITIAL SETUP AND ANALYSIS

NUMBER OF VARIABLES TO READ IN. . . . . : 13
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS. . . . : 2
TOTAL NUMBER OF VARIABLES . . . . : 15
NUMBER OF CASES TO READ IN. . . . . : TO END
CASE LABELING VARIABLES . . . . : SWSYSID
MISSING VALUES CHECKED BEFORE OR AFTER TRANS. . . . : BEFORE
BLANKS ARE. . . . . : MISSING
INPUT FILE. . . . . . . UNIT 7 . . . . DATA. . . . : \DBASEIII\RAMSS\RAASCIIE.DAT
REWIND INPUT UNIT PRIOR TO READING. . DATA. . . . . : YES
NUMBER OF WORDS OF DYNAMIC STORAGE. . . . . : 31996
NUMBER OF CASES DESCRIBED BY INPUT FORMAT . . . . . : 1

VARIABLES TO BE USED
2 APDDC   3 APSRC   4 AFRODUCT   5 AEFER   6 AESYS
7 AEFAC   8 AENVIRON   9 AMCON   10 AMMAI   11 AMANAGE
12 ASUFFORT 13 ACONFID   14 RISK   15 LRISK

INPUT FORMAT IS
(A3,12F4.2)

MAXIMUM LENGTH DATA RECORD IS 51 CHARACTERS.

INPUT VARIABLES . . .

VARIABLE INDEX	NAME	RECORD NO.	COLUMNS BEGIN	END	FIELD WIDTH	TYPE
1	SWSYSID	1	1	3	3	A
2	APDDC	1	4	7	4.2	F
3	AFSRC	1	8	11	4.2	F
4	AFRODUCT	1	12	15	4.2	F
5	AEFER	1	16	19	4.2	F
6	AESYS	1	20	23	4.2	F
7	AEFAC	1	24	27	4.2	F
8	AENVIRON	1	28	31	4.2	F
9	AMCON	1	32	35	4.2	F
10	AMMAI	1	36	39	4.2	F
11	AMANAGE	1	40	43	4.2	F
12	ASUFFORT	1	44	47	4.2	F
13	ACONFID	1	48	51	4.2	F

PRINT ALL CASES.

BMDP FILE \BMDP\RAMSS\EVAL.SAV
IS BEING WRITTEN ON UNIT 8
CODE. . . IS   EVAL
CONTENT . IS   DATA
LABEL . . IS
05/25/86   15:11:04
VARIABLES ARE
1 SWSYSID   2 APDDC   3 APSRC   4 AFRODUCT   5 AEFER
6 AESYS   7 AEFAC   8 AENVIRON   9 AMCON   10 AMMAI
11 AMANAGE   12 ASUFFORT 13 ACONFID   14 RISK   15 LRISK

Figure C-2. Evaluation Report B1 (Continued)

C-5

PAGE 5   BMDP1D EVALUATIONS: INITIAL SETUP AND ANALYSIS

BASED ON INPUT FORMAT SUPPLIED   1 RECORDS READ PER CASE.

CASE NO. LABEL	2 AFDOC	3 AFSRC	4 AFRODUCT	5 AEFER	6 AESYS	7 AEFAC	8 AENVIRON	9 AMCON	10 AMMAI	11 AMANAGE
1	3.380	3.330	3.350	4.380	3	4.250	3.880	3.190	4.120	3.660
3	4.500	4.500	4.500	3.500	2.500	3	3	4.500	3	4
4	4.540	4.500	4.250	3.670	3.500	3.500	3.560	4.560	3	3.750
5	4.690	4.180	4.270	4.380	4.750	4.380	4.500	4.500	4.500	4.530
6	4.710	4.250	4.440	4.250	5.310	5.750	4.650	4.500	5.150	4.830
7	2.830	2.830	4.480	5.170	5.440	4.500	5.450	5.310	5.380	5.340
9	4.170	4.170	2.830	3.620	5.250	4.500	4.460	4.380	3.920	4.150
10	2.420	2.670	4.170	3.620	4.940	3.750	4.350	2.930	3.810	3.370
11	5.210	4.620	2.540	2.380	2.380	4	2.840	4.380	3.920	4.150
12	5.170	4.920	4.920	4.670	4.440	5	4.370	4.300	4.060	4.180
13	3.580	4.420	4.790	4.880	5.170	4.620	5.020	5.670	4.900	5.290
14	3.580	3.580	3.580	5.250	4.620	4.620	4.830	2.810	5.080	3.950
15	4.620	4.960	4.790	5.250	4.650	4.620	4.840	4.810	5.080	4.950
16	4.670	4.960	4.820	4.250	5.380	5.750	5.130	4.750	4.830	4.790
17	5.540	5.880	5.710	4.620	4.650	5.750	5.010	3.500	4.380	3.940
18	4.420	4	4.210	4.330	4.060	3.500	3.960	4.380	4.960	4.670
19	5.040	5.040	5.040	4.380	4.100	4.950	4.480	4.250	4.750	4.500
20	5.040	5.040	5.040	4.310	3.700	5	4.340	4.310	4.750	4.530
21	2.900	3.830	3.960	4.250	3.250	3.750	3.750	3.750	5.420	4.580
22	5.530	2.900	2.900	4.750	2.500	3.500	3.580	1.500	3.880	2.690
23	5.530	5.500	5.420	5.060	5.350	5.620	5.340	5.750	5.400	5.400
24	5.460	5.420	5.440	5.080	5.230	5.800	5.370	5.560	5.400	5.480
25	5	4	4.500	5	4.620	4	4.540	4.500	4.500	4.540
26	5	4	4.500	5	4.620	4	4.540	4.500	4.580	4.540
27	5	4	4.500	4.250	4.620	4	4.340	4.500	4.580	4.540
28	3.580	3.380	3.320	4.250	4.880	3.880	4.340	4	4.210	4.110
29	3.290	3.350	3.320	4.120	4.400	3.880	4.130	3.880	3.960	3.920
30	3.290	3.350	3.320	4.250	4.560	3.880	4.230	3.880	3.960	3.920
31	3.460	3.040	3.250	4.940	5.500	4.500	4.980	4.500	4.210	4.360
32	4.540	4.620	4.580	3.620	5	2.750	3.790	2.880	4.500	4.500
33	4.080	4.670	3.880	2.380	4.500	2.250	3.040	2.880	4.250	3.560
34	4.380	4.120	4.250	4.170	5.170	5.750	5.030	4.880	5.080	4.980
35	2.420	2.080	2.250	2	4.380	2.750	2.790	3.120	3	3.040
36	4.420	4.420	4.420	3.250	3.880	5	3.290	4.380	4.380	4.380
37	4.420	4.170	4.290	5.560	4.620	4.880	5.060	4.380	5.380	5.380
38	3.830	3.750	3.790	5.310	3.940	4.880	4.710	4.500	4.170	4.330
40	4.500	4.790	4.650	4.170	3	5.250	4.140	5.250	4.580	4.920
44	MISSING	4.640	4.820	4.670	4.690	4.620	4.660	4.500	4.460	4.480
45	3.600	MISSING	MISSING	4.750	4.330	5.500	4.500	4.500	4.700	4.600
46	4.600	4.200	4.300	4.830	4.330	5.500	4.860	5.500	5	5.250
47	3.750	4	3.880	5	3.170	2	3.390	4.880	3.800	4.650
49	5.380	4.960	5.170	5.120	3.500	5.250	5.290	4.940	4.170	4.530
50	4.290	4.920	4.610	2.880	3.940	3.750	3.520	4	5.120	5.030
51	2.230	2.310	2.270	4.060	MISSING	3	3.280	4.030	3.460	1.730
52	2.900	3.880	3.390	3.940	MISSING	3	3.530	4.530	3.040	5.430
54	2.780	3.190	2.980	4.060	MISSING	3	3.470	4.280	3.320	3.790
55	3.330	3.980	3.660	4.060	MISSING	3	3.530	4.030	3.290	3.800
56	2.200	3.040	3.040	3.500	MISSING	3	3.250	4.400	4.040	3.640
57	4.460	4.670	4.570	4.940	3.940	5.500	4.790	4.940	5.420	5.180

Figure C-2.   Evaluation Report B1 (Continued)

PAGE 4   BMDF1D EVALUATIONS: INITIAL SETUP AND ANALYSIS

CASE NO.	LABEL	2 AFDOC	3 AFSRC	4 AFRODUCT	5 AEFER	6 AESYS	7 AEFAC	8 AENVIRON	9 AMCON	10 ANMA1	11 AMANAGE
53	58	4.210	4.420	4.320	5.310	5.750	6	5.690	4	4.620	4.310
54	59	4.670	4.170	4.420	4.810	5.440	5.250	5.170	4.920	5.330	5.120
55	60	3.830	2.330	3.080	4.620	3.920	5.750	4.760	2.880	3.460	3.170
56	61	3.960	4.170	4.070	4.500	3.380	2.250	3.380	MISSING	MISSING	MISSING
57	62	3.750	3.500	3.670	5.120	4.500	2.250	3.960	4.310	3.830	4.070
58	63	2.750	3.350	3.550	3.060	3.810	2.880	3.250	2.500	3.920	3.210
59	64	3.350	3.130	3.240	3.750	3.560	3.250	3.520	4	3.500	3.750
60	65	3.620	2.710	3.170	3.750	4.750	5	4.650	4.120	4.540	4.330
61	66	4.710	4.120	4.420	4.190	3.810	4.250	3.480	2.380	2.670	2.520
62	67	4.080	3.920	4	2.380	4.620	4.750	4.560	2.250	2.880	2.560
63	68	2.960	2.930	2.950	4.620	5.120	4.750	4.440	2.380	2.670	2.520
64	69	4.380	4.140	4.260	3.440	4.900	4.120	4.650	3.400	4.290	3.850
65	70	2.670	2.750	2.710	4.920	3.560	3.500	3.520	2.380	2.670	2.520
66	71	3.210	3.040	3.120	2.880	3.810	4.750	3.620	4.750	3.170	3.960
67	72	2.580	3.170	2.880	3.560	4.830	3.750	4.750	4.120	4.580	4.350
68	73	2.750	3.670	3.210	4.670	5	4.500	4.690	4.500	4.670	4.580
69	74	4.920	4.920	4.920	5.330	3.940	4.750	4.130	3.250	4.250	3.750
70	75	3.920	4.080	4	4.560	4.750	4.750	5.180	4.750	4.400	4.580
71	76	5.460	5.290	5.580	5.330	5.000	5.120	5.180	5.250	5.170	5.210
72	77	4.420	4.790	4.610	3.620	4.500	4.500	4.210	5.880	4.170	5.030
73	78	4.250	3.040	3.650	4.500	3.900	4.500	4.300	5.560	5.580	5.570
74	79	3.830	2.540	3.190	3.940	3.120	4	3.690	4	3.800	3.900
75	80	5.380	5.170	5.280	5.120	5.060	5.500	5.230	4.690	5.250	4.970

PAGE 7 BMDF1D EVALUATIONS: INITIAL SETUP AND ANALYSIS

VARIABLE NO. NAME	TOTAL FREQUENCY	MEAN	STANDARD DEVIATION	ST.ERR OF MEAN	COEFF. OF VARIATION	SMALLEST VALUE	SMALLEST Z-SCORE	LARGEST VALUE	LARGEST Z-SCORE	RANGE
2 AFDOC	73	4.040	0.890	0.1042	0.22039	2.200	-2.07	5.540	1.68	3.340
3 AFSRC	73	3.971	0.835	0.0977	0.21024	2.080	-2.27	5.880	2.29	3.800
4 AFRODUCT	73	4.007	0.813	0.0951	0.20284	2.250	-2.16	5.710	2.10	3.460
5 AEFER	74	4.267	0.824	0.0957	0.19304	2.000	-2.75	5.560	1.57	3.560
6 AESYS	68	4.351	0.809	0.0981	0.18585	2.380	-2.44	5.750	1.73	3.370
7 AEFAC	74	4.240	1.044	0.1214	0.24622	2.000	-2.15	6.000	1.69	4.000
8 AENVIRON	74	4.259	0.717	0.0834	0.16840	2.790	-2.05	5.690	1.99	2.900
9 AMCON	73	4.225	0.929	0.1088	0.22007	1.500	-2.93	5.880	1.78	4.380
10 ANMA1	73	4.249	0.781	0.0914	0.18381	2.670	-2.02	5.580	1.70	2.910
11 AMANAGE	73	4.236	0.752	0.0881	0.17761	2.520	-2.28	5.570	1.77	3.050
12 ASUFFORT	74	4.167	0.636	0.0739	0.15263	2.700	-2.31	5.430	1.98	2.730
13 ACONFID	65	0.620	0.235	0.0291	0.37901	0.100	-2.21	0.950	1.40	0.850
14 RISK	65	0.580	0.235	0.0291	0.61839	0.050	-1.40	0.900	2.21	0.850
15 LRISK	65	-0.558	1.155	0.1433	-2.07171	-2.769	-1.91	2.111	2.31	4.881

NUMBER OF INTEGER WORDS OF STORAGE USED IN PRECEDING PROBLEM   1872

Figure C-2. Evaluation Report B1 (Concluded)

C.2.2 <u>Evaluation Report B2 (See Figure C-3)</u>.

a. The control file EVAL5D.CTL produces this output, which
contains histograms of the evaluation factors and the risk variable.
A table of contents is given on page 2 for the user's convenience.
Example histograms for the variables APDOC and RISK appear on pages 3
and 14.

b. At the top of each histogram are given summary statistics for
the data used in the histogram; these statistics agree with those
produced in the table on page 7 of the. output described in
section C.2.1.   Under the heading "INTERVAL NAME" are listed the
upper endpoints (included) of the intervals used in forming the
histogram.   The histogram thus depicts the number of data values
falling in each interval.   For example, there were six APDOC values
greater than 3.25 but less than or equal to 3.5.

PAGE 1 BMDP5D
BMDP5D - HISTOGRAM AND UNIVARIATE PLOTS
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD. SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR PC VERSION MAY 1984
MANUAL REVISED -- 1983
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TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86   AT 15:12:52

PROGRAM CONTROL INFORMATION

/PROB   TITLE='EVALUATIONS. HISTOGRAMS OF FACTORS & RISK'.
/INP   FILE='\BMDP\RAMSS\EVAL.SAV'. CODE=EVAL.
/GROUP CUTP(2 TO 12)=1.25 TO 6 BY .25.
         CUTP(13)=.05 TO 1 BY .05.
/PLOT TYPE=HIST.
         VAR=2 TO 12,14.
         SIZE=41,25.
/PRINT LEVEL=BRIEF.
/END

GROUPING VARIABLE . . . .   (NONE GIVEN)

NUMBER OF CASES READ.   76
CASES WITH USE SET TO ZERO.   2
REMAINING NUMBER OF CASES   74

Figure C-3. Evaluation Report B2

PAGE 2 BMDPSD EVALUATIONS: HISTOGRAMS OF FACTORS & RISK

TABLE OF CONTENTS

VARIABLE NO. NAME	GROUP NAME	PLOT TYPE		PAGE NO.
2 AFDUC		HIST	. . . .	3
3 AFSKC		HIST	. . . .	4
4 AFRODUC1		HIST	. . . .	5
5 AEPER		HIST	. . . .	6
6 AESYS		HIST	. . . .	7
7 AEFAC		HIST	. . . .	8
8 AENVIRON		HIST	. . . .	9
9 AMCON		HIST	. . . .	10
10 AMMAI		HIST	. . . .	11
11 AMANAGE		HIST	. . . .	12
12 ASUPPORT		HIST	. . . .	13
14 RISK		HIST	. . . .	14

Figure C-3. Evaluation Report B2 (Continued)

MODELED EVALUATIONS: HISTOGRAMS OF FACTORS & RISK
HISTOGRAM OF VARIABLE   2 AFIDUC

SYMBOL   COUNT   MEAN   ST.DEV.
  X   75   4.040   0.890
EACH SYMBOL REPRESENTS   1 OBSERVATIONS

INTERVAL NAME		5	10	15	20	25	30	35	40	FREQUENCY INT.	CUM.	PERCENTAGE INT.	CUM.
1.25000	+									0	0	0.0	0.0
1.50000	+									0	0	0.0	0.0
1.75000	+									0	0	0.0	0.0
2.00000	+									0	0	0.0	0.0
2.25000	+XX									2	2	2.7	2.7
2.50000	+XX									2	4	2.7	5.5
2.75000	+XXXX									4	8	5.5	11.0
3.00000	+XXXXX									5	13	6.8	17.8
3.25000	+XX									2	15	2.7	20.5
3.50000	+XXXXXX									6	21	8.2	28.8
3.75000	+XXXXX									5	26	6.8	35.6
4.00000	+XXXXXXX									7	33	9.6	45.2
4.25000	+XXXXXX									6	39	8.2	53.4
4.50000	+XXXXXXXXXX									10	49	13.7	67.1
4.75000	+XXXXXXXXX									9	58	12.3	79.5
5.00000	+XXXXX									5	63	6.8	86.3
5.25000	+XXXX									4	67	5.5	91.8
5.50000	+XXXXX									5	72	6.8	98.6
5.75000	+X									1	73	1.4	100.0
6.00000	+									0	73	0.0	100.0
LAST	+									0	73	0.0	100.0
		5	10	15	20	25	30	35	40				

Figure C-3. Evaluation Report B2 (Continued)

PAGE 14 BMDP5D EVALUATIONS: HISTOGRAMS OF FACTORS & RISK
HISTOGRAM OF VARIABLE 14 RISK

	SYMBOL	COUNT	MEAN	ST.DEV.
	X	65	0.380	0.235

1 OBSERVATIONS

EACH SYMBOL REPRESENTS

INTERVAL NAME	Histogram	FREQUENCY INT.	CUM.	PERCENTAGE INT.	CUM.
0.000000	+	0	0	0.0	0.0
.025000	+	0	0	0.0	0.0
.050000	+	0	0	0.0	0.0
.075000	+XX	2	2	3.1	3.1
.100000	+	0	2	0.0	3.1
.125000	+XXXXX	5	7	7.7	10.8
.150000	+XXX	3	10	4.6	15.4
.175000	+	0	10	0.0	15.4
.200000	+XXXXXXXXXX	10	20	15.4	30.8
.225000	+	0	20	0.0	30.8
.250000	+XXXX	4	24	6.2	36.9
.275000	+	0	24	0.0	36.9
.300000	+XXXXXXXXXXXXX	13	37	20.0	56.9
.325000	+	0	37	0.0	56.9
.350000	+	0	37	0.0	56.9
.375000	+XX	2	39	3.1	60.0
.400000	+XXXXXXX	7	46	10.8	70.8
.425000	+	0	46	0.0	70.8
.450000	+XX	2	48	3.1	73.8
.475000	+	0	48	0.0	73.8
.500000	+	0	48	0.0	73.8
.525000	+	0	48	0.0	73.8
.550000	+XX	2	50	3.1	76.9
.575000	+	0	50	0.0	76.9
.600000	+XX	2	52	3.1	80.0
.625000	+	0	52	0.0	80.0
.650000	+XX	2	54	3.1	83.1
.675000	+	0	54	0.0	83.1
.700000	+XXXX	4	58	6.2	89.2
.725000	+	0	58	0.0	89.2
.750000	+X	1	59	1.5	90.8
.775000	+	0	59	0.0	90.8
.800000	+X	1	60	1.5	92.3
.825000	+	0	60	0.0	92.3
.850000	+XX	2	62	3.1	95.4
.875000	+	0	62	0.0	95.4
.900000	+XXX	3	65	4.6	100.0
.925000	+	0	65	0.0	100.0

```
   +----+----+----+----+----+----+----+----+
   5   10   15   20   25   30   35   40
```

NUMBER OF INTEGER WORDS OF STORAGE USED IN PRECEDING PROBLEM   3496

Figure C-3. Evaluation Report B2 (Concluded)

C-12

C.2.3 Evaluation Report B3 (See Figure C-4).

a. EVAL1R.CTL is the control file that creates this output of the risk regression analysis results for the evaluation data. A matrix of the sample linear correlation coefficients is given on page 2 for each pair of the variables used in the regression analysis.

b. The tables shown on page 3 constitute the regression results of primary interest to the user. Note that the dependent, or response, variable for the regression is the transformed risk, LRISK. Since regression analysis requires complete cases, that is, cases having valid values for all variables involved in the regression model, the set of data cases used for the regression analysis is a subset of the cases appearing on the EVAL1D.CTL output of section C.2.1. The coefficient of determination, or multiple cor-relation coefficient (R^2) is labelled "MULTIPLE R-SQUARE". Regres-sion coefficients for each of the regression variables are listed in the last table on page 3.

c. A printout of the data used in the regression begins on page 5. The column labelled "PREDICTED VALUE" contains predicted LRISK values computed from the regression equation.

d. On page 7 is a plot of the predicted and observed LRISK values versus values of the variable APRODUCT. Not shown here, but included in the full output, are similar plots for all the other regression independent variables.

e. For normal probability plot of residuals on page 12 is a diagnostic plot for checking the distribution of residuals about the regression model. Should the plotted data points (asterisks) diverge strongly from the diagonal reference line (indicated by slashes), the assumption of a normal distribution for the residuals would be called into question, and the regression results would become suspect.

```
PAGE    1  BMDP1R
BMDP1R - MULTIPLE LINEAR REGRESSION
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD. SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR PC VERSION MAY 1984
MANUAL REVISED -- 1983
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TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86            AT 15:14:49

PROGRAM CONTROL INFORMATION

/PROB  TITLE='EVALUATIONS: RISK REGRESSION ANALYSIS'.
/INP   FILE='\BMDP\RAMSS\EVAL.SAV'.  CODE=EVAL.
/VAR   USE=4 TO 7,11,14,15.
/REGR  TITLE='LRISK) VS. SUPPORTABILITY FACTORS'.
       DEPEND=LRISK.  INDEP=4 TO 7,11.

/PRINT DATA.  CORR.  RREG.
/PLOT  RESID.  VAR=4 TO 7,11.  NORM.
/END

PROBLEM TITLE IS
EVALUATIONS: RISK REGRESSION ANALYSIS

NUMBER OF VARIABLES TO READ IN. . . . . . . . . . .        15
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS. . . .         0
TOTAL NUMBER OF VARIABLES . . . . . . . . . . . . .        15
NUMBER OF CASES TO READ IN. . . . . . . . . . . . .    TO END
CASE LABELING VARIABLES . . . . . . . . . . . . . .    SWSYSID
MISSING VALUES CHECKED BEFORE OR AFTER TRANS. . . .    NEITHER
BLANKS ARE. . . . . . . . . . . . . . . . . . . . .    MISSING
INPUT FILE. . . . . . . . . .  UNIT    7  . . . . . \BMDP\RAMSS\EVAL.SAV
REWIND INPUT UNIT PRIOR TO READING. . DATA. . . . .       YES
NUMBER OF WORDS OF DYNAMIC STORAGE. . . . . . . . .     31996

INPUT BMDP FILE
CODE. . . IS    EVAL
CONTENT . IS    DATA
LABEL . . IS
03/25/86              15:11:04
VARIABLES
   1 SWSYSID     2 AFDUC       3 AFSRC       4 AFRODUCT    5 AEFER
   6 AESYS       7 AEFAC       8 AENVIRON    9 AMCON      10 AMMAI
  11 AMANAGE    12 ASUPPORT   13 ACONFID    14 RISK       15 LRISK
```

Figure C-4. Evaluation Report B3

TABLE 2 BMDPIR L(RISK) VS. SUPPORTABILITY FACTORS
CORRELATION MATRIX

		AFRODUCT 4	AEFER 5	AESYS 6	AEFAC 7	AMANAGE 11	RISK 14	LRISK 15
AFRODUCT	4	1.0000						
AEFER	5	0.4286	1.0000					
AESYS	6	0.3085	0.3963	1.0000				
AEFAC	7	0.4062	0.4846	0.4101	1.0000			
AMANAGE	11	0.5483	0.5743	0.2791	0.4100	1.0000		
RISK	14	-0.5835	-0.5874	-0.4332	-0.3734	-0.7615	1.0000	
LRISK	15	-0.6018	-0.5765	-0.4291	-0.3979	-0.7442	0.9872	1.0000

TABLE 3 BMDPIR L(RISK) VS. SUPPORTABILITY FACTORS
REGRESSION TITLE IS
L(RISK) VS. SUPPORTABILITY FACTORS

DEPENDENT VARIABLE . . . . 15 LRISK
TOLERANCE 0.0100
ALL DATA CONSIDERED AS A SINGLE GROUP
MULTIPLE R   0.8086   STD. ERROR OF EST.   0.6239
MULTIPLE R-SQUARE   0.6539

ANALYSIS OF VARIANCE

	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	P(TAIL)
REGRESSION	38.2376	5	7.6475	19.650	0.0000
RESIDUAL	20.2382	52	0.3892		

VARIABLE		COEFFICIENT	STD. ERROR	STD. REG COEFF	T	P(2 TAIL)	TOLERANCE
INTERCEPT		4.90401					
AFRODUCT	4	-0.29131	0.13090	-0.226	-2.225	0.0304	0.64641
AEFER	5	-0.15600	0.12403	-0.136	-1.258	0.2141	0.56613
AESYS	6	-0.25120	0.12905	-0.181	-1.946	0.0570	0.77162
AEFAC	7	0.04294	0.10015	0.043	0.429	0.6699	0.66939
AMANAGE	11	-0.66174	0.14256	-0.509	-4.642	0.0000	0.55331

Figure C-4. Evaluation Report B3 (Continued)

PAGE 5 HMDFIR L(RISK) VS. SUPPORTABILITY FACTORS
LIST OF PREDICTED VALUES, RESIDUALS, AND VARIABLES
NOTE - NEGATIVE CASE NUMBER DENOTES A CASE WITH MISSING VALUES.
THE NUMBER OF STANDARD DEVIATIONS FROM THE MEAN IS DENOTED BY UP TO 3 ASTERISKS TO THE RIGHT
OF EACH RESIDUAL OR VARIABLE.

MISSING VALUES AND VALUES OUT OF RANGE ARE DENOTED BY VALUES
GREATER THAN OR EQUAL TO 0.2127E+38 IN ABSOLUTE VALUE.

CASE LABEL	NO.	RESIDUAL	PREDICTED VALUE	4 AFRIDUCT	15 LRISK	5 AEFER	6 AESYS	7 AEFAC	11 AMANAGE	14 RISK
1	-1	0.2127E+38	0.2517	3.350	0.2127E+38	4.380	3.000 **	4.250	3.660	0.2127E+38
3	-2	0.212/E+38	-0.9904E-01	4.500	0.2127E+38	3.500	2.500 **	3.000 *	4.000	0.2127E+38
4	-3	0.2127E+38	-0.1170	4.250	0.2127E+38	3.670	3.500 *	3.500	3.750	0.2127E+38
5	-4	0.2127E+38	-1.026	4.270	0.2127E+38	4.380	4.750	4.380	4.530	0.2127E+38
6	5	-0.2863	-1.394	4.440	-1.681	4.250	5.310	4.380	4.850	0.1500
7	6	1.464 **	-1.861	4.480	-0.3971	5.170	5.440 *	5.750	5.340 *	0.4000
9	7	-0.4714	-0.3569	2.830 *	-0.8283	3.620	5.250 *	4.500	4.150	0.3000
10	8	-0.6751 *	-0.1533	4.170	-0.8283	3.620	4.940	4.500	3.370	0.3000
11	9	-1.007 *	0.6097	2.540 *	-0.3971	2.380 **	2.380	3.750	4.150	0.4000
12	10	0.1391	-0.9674	4.920	-0.8283	4.670	4.440	4.000	4.180	0.3000
13	11	-0.2740	-1.837	4.790	-2.111	4.880	5.170	5.000	5.290 *	0.1000 *
14	12	0.3373	-0.5340	3.580	-0.1966	5.250 *	4.620	4.620	3.950	0.4500
15	13	0.2065	-1.556	4.790	-1.349	5.250 *	4.650	4.620	4.950	0.2000
16	14	0.3653	-1.437	4.820	-1.072	4.250	5.380	5.750 *	4.790	0.2500
17	-15	0.212/E+38	-1.099	5.710 **	0.2127E+38	4.620	4.650	5.750 *	3.940 **	0.2127E+38
18	16	-0.3914	-0.9578	4.210 *	-1.349	4.330	4.060	3.500	4.670	0.2000
19	-17	0.2127E+38	-1.043	5.040 *	0.2127E+38	4.380	4.100	4.950 *	4.500	0.2127E+38
20	18	-0.1231	-0.9490	5.040 *	-1.072	4.310	3.700 *	5.000	4.530	0.2500
21	19	0.4021	-0.5987	3.960	-0.1966	4.250	3.250	3.750	4.580	0.4500
22	-20	0.2127E+38	1.060	2.900 *	0.2127E+38	4.750	2.500 **	3.500	2.690 **	0.2127E+38
23	21	0.4596	-2.140	5.420 *	-1.681	5.060	5.350	5.620 *	5.400	0.1500
24	22	0.5296E-01	-2.164	5.440 *	-2.111	5.080	5.230	5.800 *	5.480	0.1000 *
25	23	-0.1692	-1.180	4.500	-1.349	5.000	4.620	4.000	4.540	0.2000
26	24	0.212/E+38	-1.180	4.500	0.2127E+38	5.000	4.620	4.000	4.540	0.2127E+38
27	25	0.1672	1.180	4.500	1.349	5.000	4.620	4.000	4.500	0.2000

Figure C-4. Evaluation Results B3 (Continued)
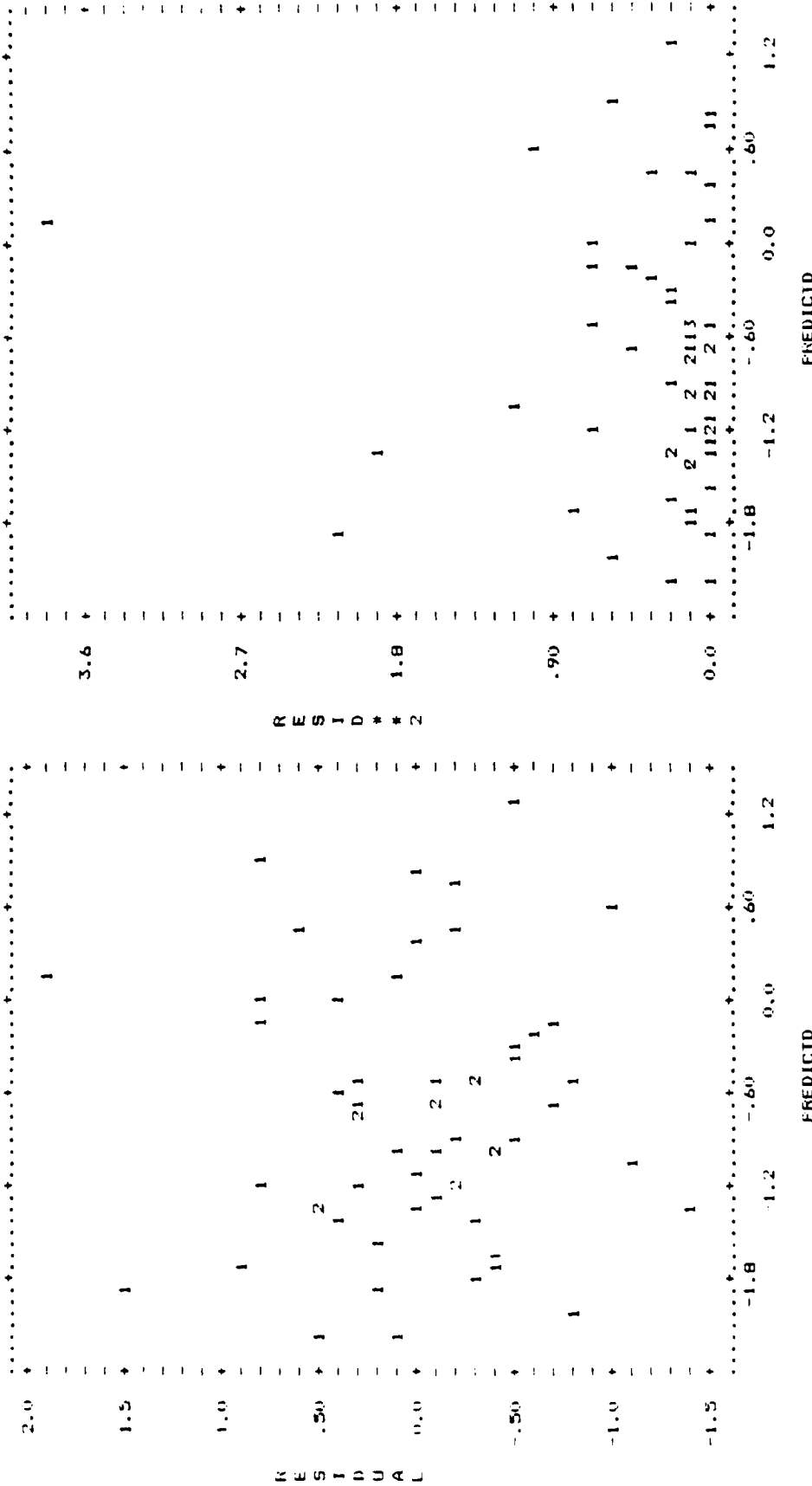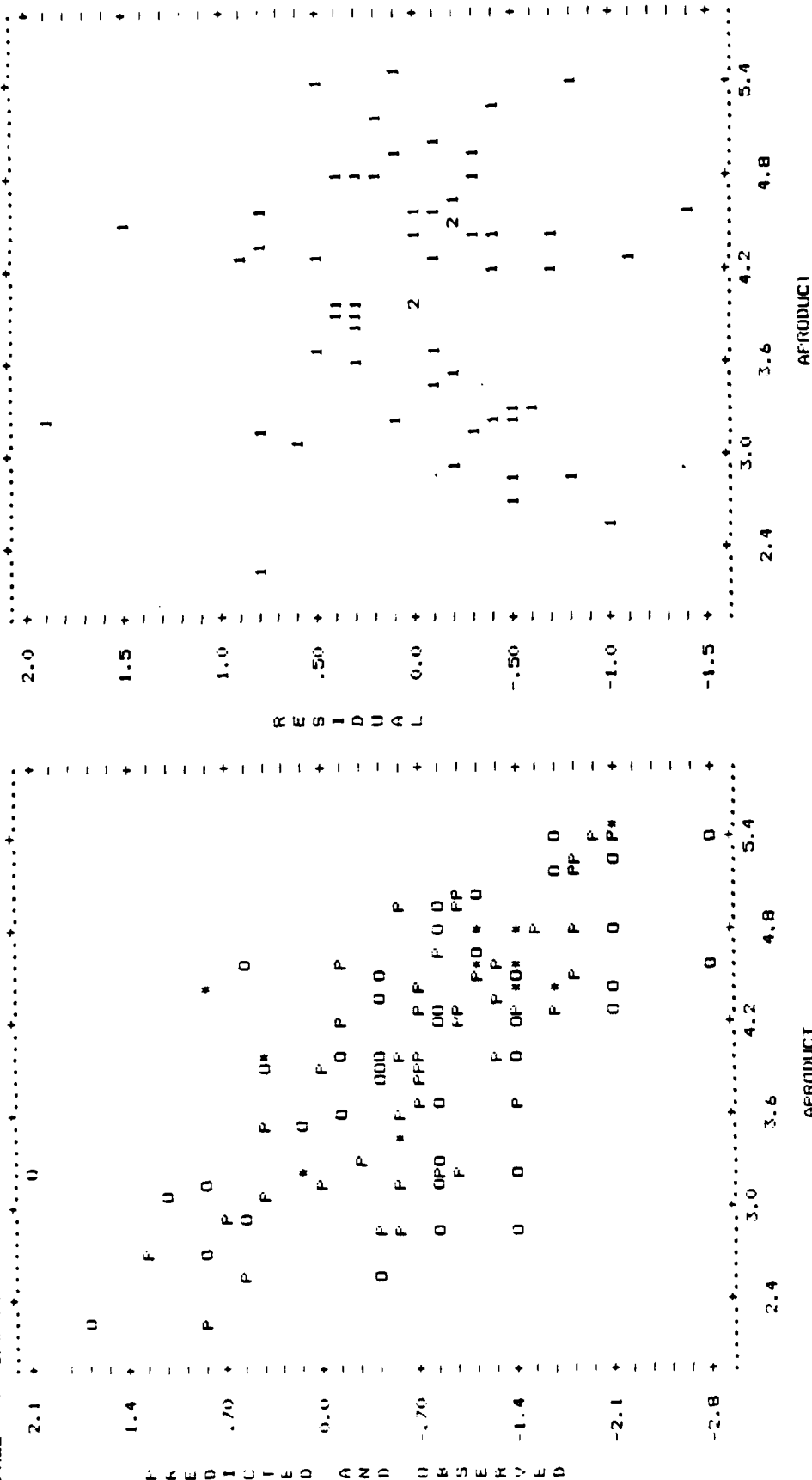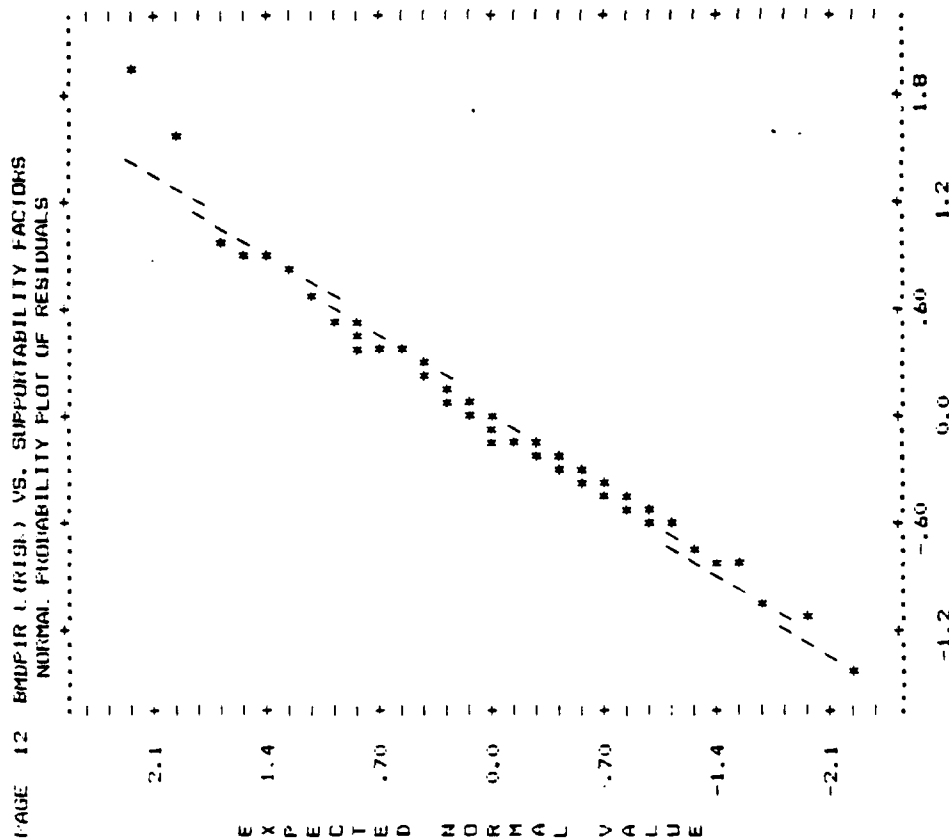
Figure C-4. Evaluation Report B3 (Continued)

Figure C-4. Evaluation Report B3 (Continued)

Figure C-4. Evaluation Report B3 (Concluded)

C.2.4 <u>Evaluation Report B4 (See Figure C-5)</u>. This output is produced by the control file MAINT1D.CTL, whose function is similar to that of the control file EVAL1D.CTL, discussed in section C.2.1. MAINT1D.CTL creates a SAVE file named MAINT.SAV. Pages 2 and 3 of the output are completely analogous to the corresponding portions of the output in section C.2.1. However, the tables on pages 28 and 35 have no analogues in the EVAL1D.CTL output. They show summary statistics for the variables not only overall but also for groups by software type.

```
PAGE   1  BMDP1D

BMDP1D - SIMPLE DATA DESCRIPTION AND DATA MANAGEMENT
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD. SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR PC VERSION MAY 1984
MANUAL REVISED -- 1983
COPYRIGHT (C) 1983 REGENTS OF UNIVERSITY OF CALIFORNIA

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86          AT 15:18:51

PROGRAM CONTROL INFORMATION

/PROB   TITLE='MAINTENANCE: INITIAL SETUP AND ANALYSIS'.
/COMM   REMARK='ALL RELEASES HAVING ONLY ONE CHANGE ARE KEPT
               IN THE SAVE FILE BUT ARE EXCLUDED FROM ALL ANALYSES
               (SEE COMMENT IN /TRAN PARAGRAPH).
/INP    VAR=26.  RECLEN=97.
        FILE='\DBASEIII\RAMSS\RAASCIIM.DAT'.
        FORM='(A3,A4,2X,F1,F5,F3,F4,3F4.2,2(F4,2F2),F5.2,
              10F4)'.
/VAR    NAME=SWSYSID,RLSID,NSWTYPE,FLINES,FCHILEV,
             NPERSONS,AVGSKILL,PDEDSW,FDEDRLS,STARTY,
             STARTM,STARTD,ENDY,ENDM,ENDD,
             RLSECM,NTOTAL,NTCORR,NIENH,NTCONV,
             NCLOW,NCMED,NCHIGH,NFNORM,NFURG,
             NFENER,PMPK,FMPC,PTCORR,PTENH,
             PTCONV,FCLOW,FCMED,FCHIGH,PPNORM,
             PFURG,PFEMER,'LN(FMPC)'.
        MISS=(4)0,(6)2*0,(16)2*0.
        MIN =(3)1,1,0,0,1,0,0,1970,1,1,1970,1,1,11*0.
        MAX =(3)7,(5)100,(7)5,1,1,1999,12,31,1999,12,31.
        LABEL=SWSYSID,RLSID.
        ADD=12.
        GROUP=NSWTYPE.
/GROUP  CODE(NSWTYPE)=1 TO 7.
        NAME(NSWTYPE)=ATD,ATE,'C E',EW,OFF,SIM,SUP.
/TRAN   PMFR=NPERSONS*PDEDSW*PDEDRLS*RLSECM.
        PMFC=PMFR/NTOTAL.
        FOR I =18 TO 26.  J=29 TO 37.
        % X(J)=X(I)/NTOTAL. %
        %FOLLOWING LINE EXCLUDES ALL SINGLE-CHANGE RELEASES.
        IF(NTOTAL EQ 1) THEN USE=0.
        'LN(FMPC)'=LN(FMPC).
/PRINT DATA.
/SAVE  CODE=MAINT.  FILE='\BMDP\RAMSS\MAINT.SAV'.  NEW.
/END

*****  TRAN    PARAGRAPH IS USED  *****
```

Figure C-5. Evaluation Report B4

PAGE 2 BMDP1D MAINTENANCE: INITIAL SETUP AND ANALYSIS

PROBLEM TITLE IS
MAINTENANCE: INITIAL SETUP AND ANALYSIS

NUMBER OF VARIABLES TO READ IN. 26
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS. . . 12
TOTAL NUMBER OF VARIABLES 38
NUMBER OF CASES TO READ IN. . . . . TO END
CASE LABELING VARIABLES . . . . SWSYSID   RLSID
MISSING VALUES CHECKED BEFORE OR AFTER TRANS. . . BEFORE
BLANKS ARE. MISSING
INPUT FILE. . . . . UNIT   7 . . . . . . \DBASEIII\RAMSB\RAASCIIM.DAT
REWIND INPUT UNIT PRIOR TO READING. . DATA. . . . YES
NUMBER OF WORDS OF DYNAMIC STORAGE. 31996
NUMBER OF CASES DESCRIBED BY INPUT FORMAT 1

VARIABLES TO BE USED

3 NSWTYPE	4 FLINES	5 FCHILEV	6 NPERSONS	7 AVGSKILL
8 PDEDSW	9 PDEDRLS	10 STARTY	11 STARTM	12 STARID
13 ENDY	14 ENDM	15 ENDD	16 RLSECM	17 NTOTAL
18 NTCORR	19 NTENM	20 NTCONV	21 NCLOW	22 NCMED
23 NCHIGH	24 NFNORM	25 NFURG	26 NFEMER	27 PMFR
28 PMFC	29 PTCORR	30 PTENM	31 PTCONV	32 PCLOW
33 PCMED	34 PCHIGH	35 PFNORM	36 PFURG	37 PPEMER
38 LN(PMFC)				

INPUT FORMAT IS
(A5,A4,2X,F1,F5,F3,F4,3F4.2,2IF4,2F2,F5.2, 1OF4)

MAXIMUM LENGTH DATA RECORD IS 95 CHARACTERS.

INPUT VARIABLES. . . . .

VARIABLE		RECORD	COLUMNS		FIELD	TYPE
INDEX	NAME	NO.	BEGIN	END	WIDTH	
1	SWSYSID	1	1	3	3	A
2	RLSID	1	4	7	4	A
3	NSWTYPE	1	10	10	1	F
4	FLINES	1	11	15	5	F
5	FCHILEV	1	16	18	3	F
6	NPERSONS	1	19	22	4	F
7	AVGSKILL	1	23	26	4.2	F
8	PDEDSW	1	27	30	4.2	F
9	PDEDRLS	1	31	34	4.2	F
10	STARTY	1	35	38	4	F
11	STARTM	1	39	40	2	F
12	STARID	1	41	42	2	F
13	ENDY	1	43	46	4	F

VARIABLE		RECORD	COLUMNS		FIELD	TYPE
INDEX	NAME	NO.	BEGIN	END	WIDTH	
14	ENDM	1	47	48	2	F
15	ENDD	1	49	50	2	F
16	RLSECM	1	51	55	5.2	F
17	NTOTAL	1	56	59	4	F
18	NTCORR	1	60	63	4	F
19	NTENM	1	64	67	4	F
20	NTCONV	1	68	71	4	F
21	NCLOW	1	72	75	4	F
22	NCMED	1	76	79	4	F
23	NCHIGH	1	80	83	4	F
24	NFNORM	1	84	87	4	F
25	NFURG	1	88	91	4	F
26	NFEMER	1	92	95	4	F

PRINT ALL CASES.

PRINT SUMMARY STATISTICS OVER ALL CASES AND
BROKEN DOWN BY INDIVIDUAL CATEGORY ON NSWTYPE

BMDP FILE \BMDP\RAMSS\MAINT.SAV
    IS BEING WRITTEN ON UNIT   8
CODE. . . IS   MAINT
CONTENT . IS   DATA
LABEL . . IS
03/25/86   15:18:51
VARIABLES ARE

1 SWSYSID	2 RLSID	3 NSWTYPE	4 FLINES	5 FCHILEV
6 NPERSONS	7 AVGSKILL	8 PDEDSW	9 PDEDRLS	10 STARTY
11 STARTM	12 STARID	13 ENDY	14 ENDM	15 ENDD
16 RLSECM	17 NTOTAL	18 NTCORR	19 NTENM	20 NTCONV
21 NCLOW	22 NCMED	23 NCHIGH	24 NFNORM	25 NFURG
26 NFEMER	27 PMFR	28 PMFC	29 PTCORR	30 PTENM
31 PTCONV	32 PCLOW	33 PCMED	34 PCHIGH	35 PFNORM
36 PFURG	37 PPEMER	38 LN(PMFC)		

Figure C-5. Evaluation Report B4 (Continued)

PAGE 3 BMDPID MAINTENANCE: INITIAL SETUP AND ANALYSIS

CASE NO.	LABEL	NSWTYPE	ILINES	ICHILEV	NPERSONS	AVGSKILL	PJEDSW	PJEDRLS	STARTY	STARTM	STARTD
1	1 A	C-E	350	14	71	3	1	.550	1979	3	7
2	1 A1	C-F	350	14	71	3	1	.0500	1980	8	3
3	1 B	C-E	350	14	74	3	1	.530	1980	3	13
4	1 C1	C-E	350	14	74	3	1	.340	1980	5	27
5	1 D	C-E	350	14	74	3	1	.450	1980	9	3
6	1 E	C-E	350	14	74	3	1	.330	1980	12	24
7	1 F	C-E	350	14	75	3	1	.570	1981	4	15
8	1 G1H	C-E	350	14	75	3	1	.410	1981	8	30
9	1 I	C-E	350	14	75	3	1	.450	1982	1	15
10	1 J	C-E	350	14	73	3	1	.440	1982	6	26
11	1 L	C-E	350	14	73	3	1	.420	1982	11	14
12	1 M	C-E	350	14	73	3	1	.420	1983	3	29
13	1 N	C-F	350	14	73	3	1	.450	1983	9	1
14	1 N	C-E	350	14	73	3	1	.450	1984	2	—
15	1 N	C-E	350	14	61	3	1	.450	1984	6	1
16	2 DGA	C-E	MISSING	0	8	MISSING	1	.450	1978	4	23
17	2 DGB	C-E	MISSING	0	10	MISSING	1	.320	1980	2	13
18	2 DGC	C-E	MISSING	0	10	MISSING	1	.280	1980	11	22
19	2 DGD	C-E	MISSING	0	9	MISSING	1	.0500	1981	5	23
20	2 DGA	C-E	MISSING	0	8	MISSING	1	.820	1979	1	1
21	2 DGB	C-E	MISSING	0	10	MISSING	1	.340	1980	11	22
22	2 DGH	C-E	MISSING	0	9	MISSING	1	.0500	1982	10	22
23	2 IIA	C-E	MISSING	0	8	MISSING	1	.450	1978	4	29
24	2 IFB	C-E	MISSING	0	8	MISSING	1	.340	1979	11	21
25	2 IFC	C-E	MISSING	0	10	MISSING	1	.310	1980	8	1
26	2 IFD	C-E	MISSING	0	10	MISSING	1	.0500	1980	11	22
27	2 IFE	C-E	MISSING	0	9	MISSING	1	.320	1981	5	23
28	2 IFF	C-F	MISSING	0	9	MISSING	1	.700	1982	12	15
29	2 IFG	C-E	MISSING	0	8	MISSING	1	.0500	1978	11	4
30	3 B	C-E	123	76	20	3	1	.450	1978	12	30
31	3 C1	C-E	123	76	20	3	1	.640	1979	5	10
32	3 C1A	C-E	123	76	20	3	1	1	1980	2	29
33	3 C3	C-F	123	76	18	3	1	.330	1981	9	6
34	3 D	C-E	123	76	18	3	1	.640	1980	2	1
35	3 F	C-E	123	76	17	3	1	.410	1980	12	24
36	3 G	C-E	123	76	17	3	1	.360	1981	5	30
37	3 H1	C-E	123	76	17	3	1	.390	1981	8	29
38	3 I	C-E	123	76	17	3	1	.420	1982	8	15
39	3 J2	C-F	123	76	17	3	1	.440	1982	1	5
40	3 L	C-E	123	76	16	3	1	.440	1982	11	12
41	3 M	C-E	123	76	16	3	1	.330	1983	11	7
42	3 N	C-E	123	76	16	3	1	.420	1983	4	15
43	4 B1	C-E	251	51	48	4	1	.330	1984	5	14
44	4 B2	C-E	251	51	48	4	1	.470	1983	11	15
45	4 B3	C-E	251	51	48	4	1	.420	1984	10	15
46	4 B4	C-E	251	51	48	4	1	.450	1984	5	—
47	4 B5	C-E	251	51	65	4	1	.0500	1979	4	8
48	4 B6	C-E	251	51	65	4	1	.500	1980	5	16

Figure C-5. Evaluation Report B4 (Continued)

THE BDM CORPORATION

PAGE 2A   BMDS ID MAINTENANCE   INITIAL SEIAA AND ANALYSIS

VARIABLE NO. NAME	GROUPING VARIABLE LEVEL	TOTAL FREQUENCY	MEAN	STANDARD DEVIATION	ST. ERR OF MEAN	COEFF. OF VARIATION	SMALLEST VALUE	SMALLEST Z-SCORE	LARGEST VALUE	LARGEST Z-SCORE	RANGE
3 NSWTYPE	NSWTYPE	504	3.789	1.396	0.0801	0.36840	1.000	-2.00	7.000	2.30	6.000
	AID	10	1.000	0.000	0.00000	0.00000	1.000	0.00	1.000	0.00	0.000
	AIE	15	2.000	0.000	0.00000	0.00000	2.000	0.00	2.000	0.00	0.000
	LE	155	3.000	0.000	0.00000	0.00000	3.000	0.00	3.000	0.00	0.000
	EW	25	4.000	0.000	0.00000	0.00000	4.000	0.00	4.000	0.00	0.000
	OPE	75	5.000	0.000	0.00000	0.00000	5.000	0.00	5.000	0.00	0.000
	SIM	2	6.000	0.000	0.00000	0.00000	6.000	0.00	6.000	0.00	0.000
	SUB	24	7.000	0.000	0.00000	0.00000	7.000	0.00	7.000	0.00	0.000
4 LINES	NSWTYPE	268	452.873	723.224	44.1780	1.67075	1.000	-0.60	2800.000	3.27	2799.000
	AID	10	210.300	317.452	100.3873	1.50952	1.000	-0.66	1000.000	2.49	999.000
	AIE	15	903.933	1104.212	285.1063	1.22156	15.000	-0.81	2600.000	1.54	2585.000
	LE	133	707.895	836.371	72.5226	1.18820	37.000	-0.80	2800.000	2.51	2763.000
	EW	22	46.636	66.724	14.2255	1.43072	17.000	-0.44	300.000	3.80	283.000
	OPE	75	58.356	74.752	8.7490	1.28096	12.000	-0.62	450.000	5.24	438.000
	SIM	2	155.500	140.714	99.5000	1.12123	26.000	-0.71	225.000	0.71	199.000
	SUB	11	91.769	27.978	8.3145	0.32667	31.000	-2.03	118.000	0.87	87.000
5 LINES	NSWTYPE	271	41.979	41.931	2.4581	0.95343	0.000	-1.05	100.000	1.34	100.000
	AID	10	57.200	41.719	13.0663	0.7237	10.000	-1.14	97.000	0.96	87.000
	AIE	15	87.667	18.113	4.6769	0.20662	30.000	-3.18	100.000	0.68	70.000
	LE	136	57.923	58.186	3.0672	0.65925	0.000	-1.52	100.000	1.10	100.000
	EW	23	0.000	0.000	0.0000	0.00000	0.000	0.00	0.000	0.00	0.000
	OPE	75	20.425	55.957	4.2062	1.75951	0.000	-0.57	100.000	2.21	100.000
	SIM	2	0.000	0.000	0.0000	0.00000	0.000	0.00	0.000	0.00	0.000
	SUB	13	54.000	42.550	11.8012	1.25147	0.000	-0.80	100.000	1.55	100.000
6 PERSONS	NSWTYPE	201	54.402	25.150	2.0249	1.02117	1.000	-0.95	130.000	2.72	129.000
	AID	10	8.500	11.546	3.5878	1.33477	3.000	-0.48	40.000	2.78	37.000
	AIE	15	10.373	3.885	1.0032	0.37599	2.000	-2.14	18.000	1.97	16.000
	LE	130	57.168	34.768	2.7927	0.60818	5.000	-1.50	130.000	2.09	125.000
	EW	22	7.273	5.444	1.1606	0.74854	1.000	-1.15	20.000	2.34	19.000
	OPE	75	7.370	3.987	0.3967	0.45987	1.000	-1.88	15.000	2.25	14.000
	SIM	2	5.500	0.707	0.5000	0.20203	3.000	-0.71	4.000	0.71	1.000
	SUB	24	22.875	21.766	4.4430	0.95153	2.000	-0.96	46.000	1.06	44.000
7 AVGSLITY	NSWTYPE	209	3.301	0.631	0.0371	0.19112	1.780	-2.41	5.000	2.69	3.220
	AID	10	3.516	0.389	0.1231	0.11060	3.000	-1.33	4.000	1.24	1.000
	AIE	15	3.644	0.687	0.1773	0.18845	2.000	-2.39	4.540	1.30	2.540
	LE	141	3.275	0.478	0.0403	0.14606	2.610	-1.39	4.400	2.35	1.790
	EW	22	3.290	0.218	0.0464	0.06617	3.170	-0.55	3.800	2.34	0.630
	OPE	75	3.591	0.885	0.1022	0.26108	1.780	-1.82	5.000	1.82	3.220
	SIM	2	3.375	0.530	0.3750	0.15713	3.000	-0.71	3.750	0.71	0.750
	SUB	24	2.874	0.592	0.1209	0.20603	2.000	-1.48	4.000	1.90	2.000

Figure C-5.   Evaluation Report B4 (Continued)
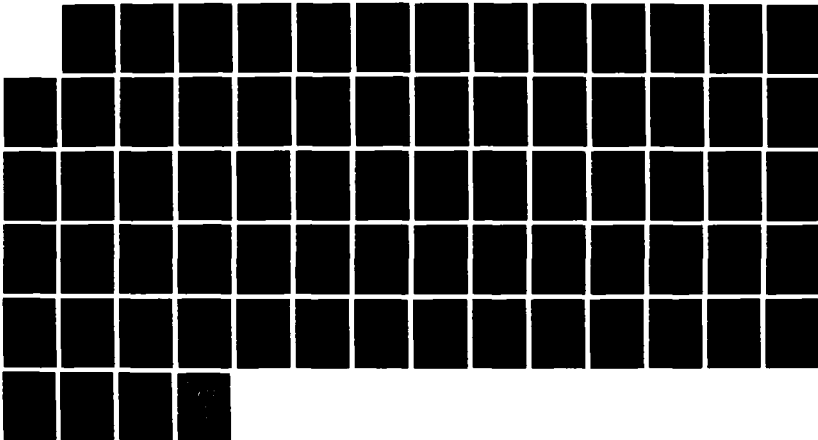
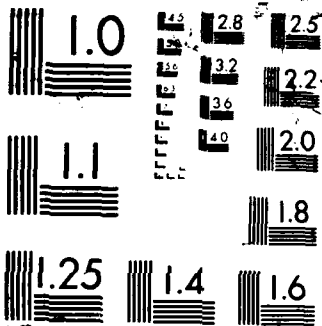PAGE 35 BMDFID MAINTENANCE: INITIAL SETUP AND ANALYSIS

VARIABLE NO. NAME	GROUPING VARIABLE LEVEL	TOTAL FREQUENCY	MEAN	STANDARD DEVIATION	ST.ERR OF MEAN	COEFF. OF VARIATION	SMALLEST VALUE	Z-SCORE	LARGEST VALUE	Z-SCORE	RANGE
38 LN(FW-C)											
NSWTYPE	AID	277	0.940	1.051	0.0632	1.11808	-3.352	-4.08	3.219	2.17	6.571
	AIE	6	0.452	0.552	0.2253	1.22079	-0.310	-1.38	1.245	1.44	1.554
	C-E	14	1.154	1.262	0.3373	1.09336	-0.644	-1.43	3.104	1.54	3.748
	EW	155	1.103	0.862	0.0692	0.78149	-2.813	-4.54	3.219	2.46	6.032
	OFP	22	1.036	0.960	0.2047	0.92711	-0.214	-1.30	2.828	1.87	3.042
	SIM	61	0.730	1.014	0.1299	1.38872	-2.753	-3.43	2.536	1.78	5.289
	SUP	0									
		19	0.177	1.934	0.4437	10.94697	-3.352	-1.82	2.337	1.12	5.689

NO. OF VALUES MISSING OR OUTSIDE THE RANGE   0

VARIABLE NO. NAME	CATEGORY NAME	CATEGORY FREQUENCY	TOTAL FREQUENCY
3 NSWTYPE			304
	AID	10	
	AIE	15	
	C-E	153	
	EW	23	
	OFF	75	
	SII	2	
	SUP	24	

NUMBER OF INTEGER WORDS OF STORAGE USED IN PRECEDING PROBLEM   4752

Figure C-5. Evaluation Report B4 (Concluded)

```
PAGE   1  BMDP5D
BMDP5D - HISTOGRAM AND UNIVARIATE PLOTS
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD. SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR PC VERSION MAY 1984
MANUAL REVISED -- 1983
COPYRIGHT (C) 1983 REGENTS OF UNIVERSITY OF CALIFORNIA

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86          AT 15:28:37

PROGRAM CONTROL INFORMATION

/PROB    TITLE='MAINTENANCE PROFILE; ALL RELEASES'.
/COMM    REMARK='ALL RELEASES HAVING ONLY ONE CHANGE ARE
                 EXCLUDED FROM THIS ANALYSIS.'
/INP     FILE='\BMDP\RAMS\MAINT.SAV'.    CODE=MAINT.
/GROUP   CUTP(FMPC)=1 TO 30.
/PLOT    VAR=FMPC.
/PRINT   LEVEL=BRIEF.
/END

GROUPING VARIABLE . . . . . . . . . . . . . .    (NONE GIVEN)

NUMBER OF CASES READ. . . . . . . . . . . .         333
CASES WITH USE SET TO ZERO . . . . . . . .           29
   REMAINING NUMBER OF CASES . . . . . . .          304
```

Figure C-6. Evaluation Report B5

C.2.5 <u>Evaluation Report B5 (See Figure C-6)</u>. This output is created
by the control file MAINT5D.CTL.   It is similar to the output of
EVAL5D.CTL, described in section C.2.2.   Whereas the output of
EVAL5D.CTL contains histograms for several variables, this output
contains histograms of one variable (PMPC, person months per change)
over all software types and for each software type.   Interpretation
of the histograms is the same for both outputs.

PAGE 3 BMDP5D MAINTENANCE PROFILE: ALL RELEASES
HISTOGRAM OF VARIABLE 28 FMFC

SYMBOL COUNT MEAN ST.DEV.
X 277 3.894 3.583

EACH SYMBOL REPRESENTS 1 OBSERVATIONS

INTERVAL NAME		FREQUENCY INT.	CUM.	PERCENTAGE INT.	CUM.
*1.000000	+XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	33	33	11.9	11.9
*2.000000	+XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	65	98	23.5	35.4
*3.000000	+XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	55	153	19.9	55.2
*4.000000	+XXXXXXXXXXXXXXXXXXXXXXXXXXX	27	180	9.7	65.0
*5.000000	+XXXXXXXXXXXXXXXXXXXXXXXXX	25	205	9.0	74.0
*6.000000	+XXXXXXXXXXXXXXXXXXXX	20	225	7.2	81.2
*7.000000	+XXXXXXXXXXXXX	13	238	4.7	85.9
*8.000000	+XXXXXX	6	244	2.2	88.1
*9.000000	+XXXXXXX	7	251	2.5	90.6
*10.00000	+XXXXXXXX	8	259	2.9	93.5
*11.0000	+XXXXXX	6	265	2.2	95.7
*12.0000	+XX	2	267	0.7	96.4
*13.0000	+XXX	3	270	1.1	97.5
*14.0000	+	0	270	0.0	97.5
*15.0000	+XXX	3	273	1.1	98.6
*16.0000	+X	1	274	0.4	98.9
*17.0000	+X	1	275	0.4	99.3
*18.0000	+	0	275	0.0	99.3
*19.0000	+	0	275	0.0	99.3
*20.0000	+	0	275	0.0	99.3
*21.0000	+	0	275	0.0	99.3
*22.0000	+	0	275	0.0	99.3
*23.0000	+X	1	276	0.4	99.6
*24.0000	+	0	276	0.0	99.6
*25.0000	+X	1	277	0.4	100.0
*26.0000	+	0	277	0.0	100.0
*27.0000	+	0	277	0.0	100.0
*28.0000	+	0	277	0.0	100.0
*29.0000	+	0	277	0.0	100.0
*30.0000	+	0	277	0.0	100.0
*LAST	+	0	277	0.0	100.0

```
 +----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
 5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
```

NUMBER OF INTEGER WORDS OF STORAGE USED IN PRECEDING PROBLEM 2084

Figure C-6. Evaluation Report B5 (Continued)

PAGE 4 BMDP5D
BMDP5D - HISTOGRAM AND UNIVARIATE PLOTS

03/25/86 AT 15:29:11

PROGRAM CONTROL INFORMATION

```
/PROB   TITLE='MAINTENANCE PROFILES; BY SW TYPE'.
/COMM   REMARK='ALL RELEASES HAVING ONLY ONE CHANGE ARE
        EXCLUDED FROM THIS ANALYSIS.
/INP    FILE='\BMDP\RAMSS\MAINT.SAV'.   CODE=MAINT.
/VAR    GROUP=NSWTYPE.
/GROUP  CUTP(PMFC)=1 TO 30.
/PLOT   VAR=PMFC.  GROUP=ALL.  GROUP=EACH.
/PRINT  LEVEL=BRIEF.
/END
```

GROUPING VARIABLE . . . . 3 NSWTYPE

NUMBER OF CASES READ. 333
  CASES WITH USE SET TO ZERO 29
  REMAINING NUMBER OF CASES 304

PAGE 5 BMDP5D MAINTENANCE PROFILES; BY SW TYPE

TABLE OF CONTENTS

VARIABLE NO. NAME	GROUP NAME	PLOT TYPE	PAGE NO.
28 PMFC	AID	HIST	6
	ATE		
	C-E		
	EM		
	OFP		
	SIM		
	SUP		
28 PMFC	AID	HIST	7
28 PMFC	ATE	HIST	8
28 PMFC	C-E	HIST	9
28 PMFC	EM	HIST	10
28 PMFC	OFP	HIST	11
28 PMFC	SIM	HIST	12
28 PMFC	SUP	HIST	13

Figure C-6. Evaluation Report B5 (Continued)

PAGE 6 BMDFSD MAINTENANCE PROFILES: BY SW TYPE
HISTOGRAM OF VARIABLE 2B FMFC

	SYMBOL	COUNT	MEAN	ST.DEV.
ATD	A	6	1.786	1.008
AIE	B	14	5.968	6.452
C-E	C	155	4.118	3.410
EW	D	22	4.415	4.572
OFP	E	61	3.067	2.720
SIM	F	0	0.000	0.000
SUP	G	19	3.248	3.101

EACH SYMBOL REPRESENTS 1 OBSERVATIONS

INTERVAL NAME		FREQUENCY INT.	CUM.	PERCENTAGE INT.	CUM.
#1.00000	+ABBBCCCCCICCCCCCDDDDEEEEEGGGGGG	33	33	11.9	11.9
#2.00000	+AAABCCCCCICCCCCCCCCCCCCCCCCCDDDEEEEEEEEEEEEEGG	65	98	23.5	35.4
#3.00000	+AHHCCCCCICCCCCCCCCCCCCCCCCCCCDEEEEEEEEEEEEEGG	55	153	19.9	55.2
#4.00000	+ABCCCCCCCICCCCCCDDDDEEEEEGGG	27	180	9.7	65.0
#5.00000	ICCCCCCCCCICCCCCCEEEEEGGG	25	205	9.0	74.0
#6.00000	+BCCCCCCCCCICCCCCCDEEB	20	225	7.2	81.2
#7.00000	+BCCCCCCCCDEIEG	13	238	4.7	85.9
#8.00000	+CCCEEE	6	244	2.2	88.1
#9.00000	+CCCICCE	7	251	2.5	90.6
#10.00000	+BCCCCCDG	8	259	2.9	93.5
#11.00000	+CCCEEG	6	265	2.2	95.7
#12.00000	+BD	2	267	0.7	96.4
#13.00000	+CCE	3	270	1.1	97.5
#14.00000	+	0	270	0.0	97.5
#15.00000	+BCD	3	273	1.1	98.6
#16.00000	+C	1	274	0.4	98.9
#17.00000	+D	1	275	0.4	99.3
#18.00000	+	0	275	0.0	99.3
#19.00000	+	0	275	0.0	99.3
#20.00000	+	0	275	0.0	99.3
#21.00000	+	0	275	0.0	99.3
#22.00000	+	0	275	0.0	99.3
#23.00000	+B	1	276	0.4	99.6
#24.00000	+	0	276	0.0	99.6
#25.00000	+C	1	277	0.4	100.0
#26.00000	+	0	277	0.0	100.0
#27.00000	+	0	277	0.0	100.0
#28.00000	+	0	277	0.0	100.0
#29.00000	+	0	277	0.0	100.0
#30.00000	+	0	277	0.0	100.0
#LAST	+				

```
+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
 5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
```

Figure C-6. Evaluation Report B5 (Continued)

TABLE 9 BMDFSD MAINTENANCE PROFILES, BY SW TYPE
HISTOGRAM OF VARIABLE 28 / MFC

	SYMBOL	COUNT	MEAN	ST.DEV.
C E	C	155	4.118	3.410

EACH SYMBOL REPRESENTS 1 OBSERVATIONS

INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
1.00000	12	12	7.7	7.7
2.00000	31	43	20.0	27.7
3.00000	36	79	23.2	51.0
4.00000	14	93	9.0	60.0
5.00000	18	111	11.6	71.6
6.00000	15	126	9.7	81.3
7.00000	7	133	4.5	85.8
8.00000	3	136	1.9	87.7
9.00000	6	142	3.9	91.6
10.00000	5	147	3.2	94.8
11.00000	3	150	1.9	96.8
12.00000	0	150	0.0	96.8
13.00000	2	152	1.3	98.1
14.00000	0	152	0.0	98.1
15.00000	1	153	0.6	98.7
16.00000	1	154	0.6	99.4
17.00000	0	154	0.0	99.4
18.00000	0	154	0.0	99.4
19.00000	0	154	0.0	99.4
20.00000	0	154	0.0	99.4
21.00000	0	154	0.0	99.4
22.00000	0	154	0.0	99.4
23.00000	0	154	0.0	99.4
24.00000	0	154	0.0	99.4
25.00000	1	155	0.6	100.0
26.00000	0	155	0.0	100.0
27.00000	0	155	0.0	100.0
28.00000	0	155	0.0	100.0
29.00000	0	155	0.0	100.0
30.00000	0	155	0.0	100.0
LAST	0	155	0.0	100.0

Figure C-6. Evaluation Report B5 (Concluded)

C.2.6 <u>Evaluation Report B6 (See Figure C-7)</u>. Created by the control file MAINT7D.CTL, this output is related to that of the file MAINT5D.CTL in the preceding section in that it provides histograms of PMPC by software type, but in a side-by-side format (page 2) on a single page instead of on multiple pages. Summary statistics are also tabulated for all software types (groups) combined and for each group individually.

PAGE 1 BMDP/7D
BMDP/7D - DESCRIPTION OF GROUPS (STRATA) WITH HISTOGRAMS AND ANALYSIS OF VARIANCE
BMDP STATISTICAL SOFTWARE, INC.
1964 WESTWOOD BLVD, SUITE 202
LOS ANGELES, CA 90025
(213) 475-5700
PROGRAM REVISED FOR IC VERSION MAY 1984
MANUAL REVISED -- 1983
COPYRIGHT (C) 1983 REGENTS OF UNIVERSITY OF CALIFORNIA

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS. IN THE PRINT PARAGRAPH.

03/25/86   AT 15:31:56

PROGRAM CONTROL INFORMATION

/PROB   TITLE='MAINTENANCE: COMPARISON OF SW TYPE PROFILES'.
/COMM   REMARK='ALL RELEASES HAVING ONLY ONE CHANGE ARE
                EXCLUDED FROM THIS ANALYSIS.   CODE=MAINT.
/INP   FILE='\BMDP\RAMSS\MAINT.SAV'.
/HIST   GROUP=NSWTYPE.   VAR=FMPC, 'LN(FMPC)'.   INCR=(FMPC)1.
/PRINT LEVEL=BRIEF.
/END

NUMBER OF CASES READ . . . . :   333
   CASES WITH USE SET TO ZERO . . . . . . :   29
   REMAINING NUMBER OF CASES . . . . . . :   304

Figure C-7. Evaluation Report B6

PAGE 2 BMDF-7D MAINTENANCE: COMPARISON OF SW TYPE PROFILES

HISTOGRAM OF : FMPC * (VAR. 28) GROUPED BY : NSWTYPE * (VAR. 3)

	ATD	AIE	C-E	EW	OFP	SIM	SUP

VAR 28
EXCLUDED ****
VALUES

COMPUTATIONS WHICH FOLLOW EXCLUDE VALUES LISTED ABOVE

GROUP MEANS ARE DENOTED BY M'S IF THEY COINCIDE WITH *'S, N'S OTHERWISE

	ATD	AIE	C-E	EW	OFP	SIM	SUP		ALL GROUPS COMBINED
MEAN	1.786	5.968	4.118	4.415	3.067	0.000	3.248	MEAN	3.894
STD.DEV.	1.008	6.452	3.410	4.572	2.720	0.000	3.101	STD.DEV.	3.583
R.E.S.D.	1.094	6.513	3.067	4.363	2.581	0.000	3.118	R.E.S.D.	3.236
S.E.M.	0.412	1.724	0.274	0.975	0.348	0.000	0.711	S.E.M.	0.215
MAXIMUM	3.471	22.286	25.000	16.914	12.632	0.000	10.350	SAMPLE SIZE	277
MINIMUM	0.734	0.525	0.060	0.808	0.064	-0.000	0.035		
SAMPLE SIZE	6	14	155	22	61	0	19		

ONE WAY ANALYSIS OF VARIANCE

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	TAIL PROB.
BETWEEN	150.280	5	30.056	2.40	0.0375
WITHIN	3392.536	271	12.519		

ANALYSIS OF VARIANCE; WITHOUT EQUAL VARIANCE ASSUMPTION

		DF	MEAN SQUARE	F VALUE	TAIL PROB.
WELCH	BETWEEN	5	5.297	4.95	0.0014
	WITHIN	38	1.071		
BROWN-	BETWEEN	5	150.280	1.89	0.1158
FORSYTHE	WITHIN	44	79.604		

LEVENE'S TEST FOR EQUALITY OF VARIANCES

	DF	MEAN SQUARE	F VALUE	TAIL PROB.
BETWEEN	5	27.356	4.96	0.0002
WITHIN	271	5.516		

NOTE ONLY THOSE GROUPS WITH NON-ZERO VARIANCE ARE USED IN THE COMPUTATIONS.

Figure C-7. Evaluation Report B6 (Concluded)

C.2.7 <u>Evaluation Report B7 (See Figure C-8)</u>.   The output of this
section, produced by the control file MAINTIR.CTL is entirely
analogous to the output of the control file EVALIR.CTL in
section C.2.3. Note in the tables of regression results on page 3 of
the output that the dependent variable is the natural logarithm of
PMPC - denoted "LN(PMPC)".

Figure C-8. Evaluation Report B7

PAGE 2 BMDP1R SW TYPE DUMMY VARIABLES PLUS COVARIATES
CORRELATION MATRIX

		AVGSHLL 7	FICORR 29	FCLOW 32	PCHIGH 34	FFNORM 35	LN(PMFC) 38	ATD 39	ATE 40	C-E 41
AVGSHLL	7	1.0000								
FICORR	29	0.0256	1.0000							
PCLOW	32	-0.3374	0.2385	1.0000						
FCHIGH	34	0.2755	-0.3789	-0.6213	1.0000					
FFNORM	35	-0.1461	-0.0065	-0.0077	0.0504	1.0000				
LN(PMFC)	38	0.3597	-0.0842	-0.2051	0.3135	-0.2697	1.0000			
ATD	39	0.0937	-0.0741	-0.0425	0.1350	0.0685	-0.0682	1.0000		
ATE	40	0.2416	0.0658	-0.0118	-0.0093	-0.4309	0.1501	-0.0519	1.0000	
C-E	41	0.1249	0.4724	0.0720	-0.1164	-0.1381	0.1558	-0.1587	-0.2404	1.0000
EW	42	0.0659	-0.4656	-0.1840	0.2146	0.0607	0.1959	-0.0438	-0.0663	-0.2029
OFP	43	-0.1642	-0.2419	-0.2317	0.0921	0.2411	-0.1826	-0.1206	-0.1826	-0.5588

		EW 42	OFP 43
EW	42	1.0000	
OFP	43	-0.1541	1.0000

Figure C-8. Evaluation Report B7 (Continued)

PAGE 3 BDM-TR SW TYPE DUMMY VARIABLES PLUS COVARIATES
REGRESSION TITLE IS
SW TYPE DUMMY VARIABLES PLUS COVARIATES

DEPENDENT VARIABLE . . . . 38 (N(FM-C)
TOLERANCE 0.0100
ALL DATA CONSIDERED AS A SINGLE GROUP
MULTIPLE R   0.5774   STD. ERROR OF EST.   0.9509
MULTIPLE R SQUARE   0.3334

ANALYSIS OF VARIANCE

	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	P(TAIL)
REGRESSION	63.3254	10	6.3325	7.003	0.0000
RESIDUAL	126.5911	140	0.9042		

VARIABLE		COEFFICIENT	STD. ERROR	STD. REG COEFF	T	P(2 TAIL)	TOLERANCE
INTERCEPT		0.07083					
AVGSLILI	7	0.54837	0.15224	0.323	4.147	0.0001	0.78516
FICORR	29	-0.02948	0.39988	-0.007	-0.074	0.9413	0.52019
FCLOW	32	0.21815	0.40660	0.052	0.537	0.5924	0.51666
FCHIGH	34	2.09568	0.78857	0.255	2.658	0.0088	0.51551
FFNORM	35	-1.57228	0.61743	-0.208	-2.546	0.0120	0.71313
AID	39	-0.50845	0.49283	-0.081	-1.017	0.3108	0.74867
AIE	40	0.14413	0.43891	0.033	0.328	0.7431	0.46024
CE	41	0.35255	0.29391	0.155	1.200	0.2324	0.28386
EW	42	0.85802	0.46308	0.171	1.853	0.0660	0.55656
OFP	43	0.04114	0.29275	0.017	0.141	0.8884	0.33599

Figure C-8. Evaluation Report B7 (Continued)

PAGE 2 DUMMY VARIABLES PLUS COVARIATES
LIST OF PREDICTED VALUES, RESIDUALS, AND VARIABLES
NOTE - NEGATIVE CASE NUMBER DENOTES A CASE WITH MISSING VALUES.
THE NUMBER OF STANDARD DEVIATIONS FROM THE MEAN IS DENOTED BY UP TO 3 ASTERISKS TO THE RIGHT
OF EACH RESIDUAL OR VARIABLE.

MISSING VALUES AND VALUES OUT OF RANGE ARE DENOTED BY VALUES
GREATER THAN OR EQUAL TO 0.2127E+38 IN ABSOLUTE VALUE.

CASE LABEL	NO.	RESIDUAL	PREDICTED VALUE	7 AVGSKILL 39 AID	29 FICORR 40 AIE	32 FCLOW 41 C-E	34 FCHIGH 42 EW	35 FFNORM 43 OFP	38 LN(FMPC)
5 I	104	0.6395	0.9545	2.610 / 0.0000	0.7257 / 0.0000	0.8407 * / 1.0000	0.4425E-01 / 0.0000	0.7345 * / 0.0000	1.594
5 J	105	0.5300	1.430	2.610 / 0.0000	0.7571 / 0.0000	0.8000 / 1.000	0.5714E-01 / 0.0000	0.4429 / 0.0000	1.760 ***
5 (	106	0.6690	0.8855	2.610 / 0.0000	0.0000 / 0.7907	0.8605 * / 1.000	0.3488E-01 / 0.0000	0.7674 / 0.0000	1.554 *
5 L	107	1.127 *	0.7910	2.610 / 0.0000	0.6349 / 0.0000	0.7778 * / 1.000	0.6349E-01 / 0.0000	0.8571 / 0.0000	1.918
5 M	108	0.9488	0.7692	2.610 / 0.0000	0.7826 / 0.0000	0.8406 * / 1.000	0.5797E-01 / 0.0000	0.8696 / 0.0000	1.718
5 N	109	0.7965	0.7295	2.610 / 0.0000	0.8701 / 0.0000	0.8571 * / 1.000	0.3896E-01 / 0.0000	0.8701 / 0.0000	1.526
6 V476	-121	0.2127E+38	0.2127E+38	3.200 / 0.0000	0.2127E+38 / 0.0000	0.2127E+38 / 0.0000	0.2127E+38 *** / 0.2127E+38	0.2127E+38 / 0.0000	0.2127E+38
7 B1V3	126	-0.5065	1.787	3.170 / 0.0000	0.3438 / 0.0000	0.2188 / 0.0000	0.3125 *** / 1.000	0.0000 / 0.0000	1.281
7 B2V4	127	1.072 *	1.756	3.170 / 0.0000	0.0000 ** / 0.0000	0.2857 / 0.0000	0.2857 *** / 1.000	1.000 / 0.0000	2.828 *
7 B3V5	128	0.2011	1.655	3.170 / 0.0000	0.0000 ** / 0.0000	0.1667 / 0.0000	0.2500 *** / 1.000	0.0000 / 0.0000	1.856
7 B5V6	129	-0.2463E-01	1.593	3.170 / 0.0000	0.1250 ** / 0.0000	0.5000 / 0.0000	0.1875 *** / 1.000	1.000 / 0.0000	1.569
8 B4	-130	0.2127E+38	0.2127E+38	0.2127E+38 / 0.0000	0.3077 * / 0.0000	0.6154 / 0.0000	0.1538 *** / 1.000	1.000 / 0.0000	-0.2136
9 B4	131	-1.429 *	1.360	3.500 / 0.0000	0.4444 / 0.0000	0.4444 / 0.0000	0.0000 *** / 1.000	0.0000 / 0.0000	-0.6899E-01
10 B4	132	-0.4175	0.5533	3.500 / 0.0000	0.5000 / 0.0000	0.5000 / 0.0000	0.0000 *** / 1.000	1.000 / 0.0000	0.1358
11 B4	133	-1.036 *	0.4425	3.000 / 0.0000	0.8737 / 1.000	0.7263 / 0.0000	0.1053E-01 / 0.0000	1.000 / 1.000	-0.5931
12 B2	134	0.3525	2.298	3.800 / 0.0000	1.000 *** / 0.8696E-01**	0.0000 / 0.3913	0.3043 * / 0.9130	0.0000 / 0.0000	2.650
12 B3	135	0.2418	2.194	3.800 / 0.0000	0.0000 / 0.9524E-01**	0.3810 / 0.0000	0.2857 *** / 1.000	0.9524 / 0.0000	2.436
12 B4	136	0.923E-01 *	2.141	3.800 / 0.0000	0.4167E-01** / 0.0000	0.4167 / 0.0000	0.2917 *** / 1.000	1.000 / 0.0000	2.234
13	-137	0.2127E+38	0.2127E+38	2.000 / 0.0000	0.2127E+38 *** / 1.000 ***	0.0000 / 0.0000	0.2127E+38 *** / 0.2127E+38	0.2127E+38 / 0.0000	0.2127E+38
17 B1	143	0.9587 *	1.393	3.270 / 0.0000	0.5833 / 0.0000	0.8333E-01* / 0.0000	0.5000 ** / 0.0000	0.0000 / 0.0000	2.351
18 B1	144	-1.266 *	2.346	4.540 / 0.0000	0.8679 / 1.000 ***	0.6038 / 0.0000	0.1887 / 0.0000	0.5472 / 1.000 **	1.080
18 B2	145	-0.1826	1.865	4.540 / 0.0000	0.9310 *** / 1.000 ***	0.5862 / 0.0000	0.1724 / 0.0000	0.8276 / 0.0000	1.683
18 B3	146	1.577 *	1.527	4.540 / 0.0000	1.000 * / 1.000 ***	0.5714 / 0.0000	0.1429 / 0.0000	1.000 / 0.0000	3.104
18 B4	147	1.027 *	1.625	4.540 / 0.0000	0.9091 / 1.000 ***	0.6364 / 0.0000	0.1818 / 0.0000	1.000 / 0.0000	2.652
19 B1	150	0.6400	0.9042	3.400 / 0.0000	1.000 * / 0.0000	1.000 / 0.0000	0.0000 / 0.0000	1.000 / 0.0000	1.552
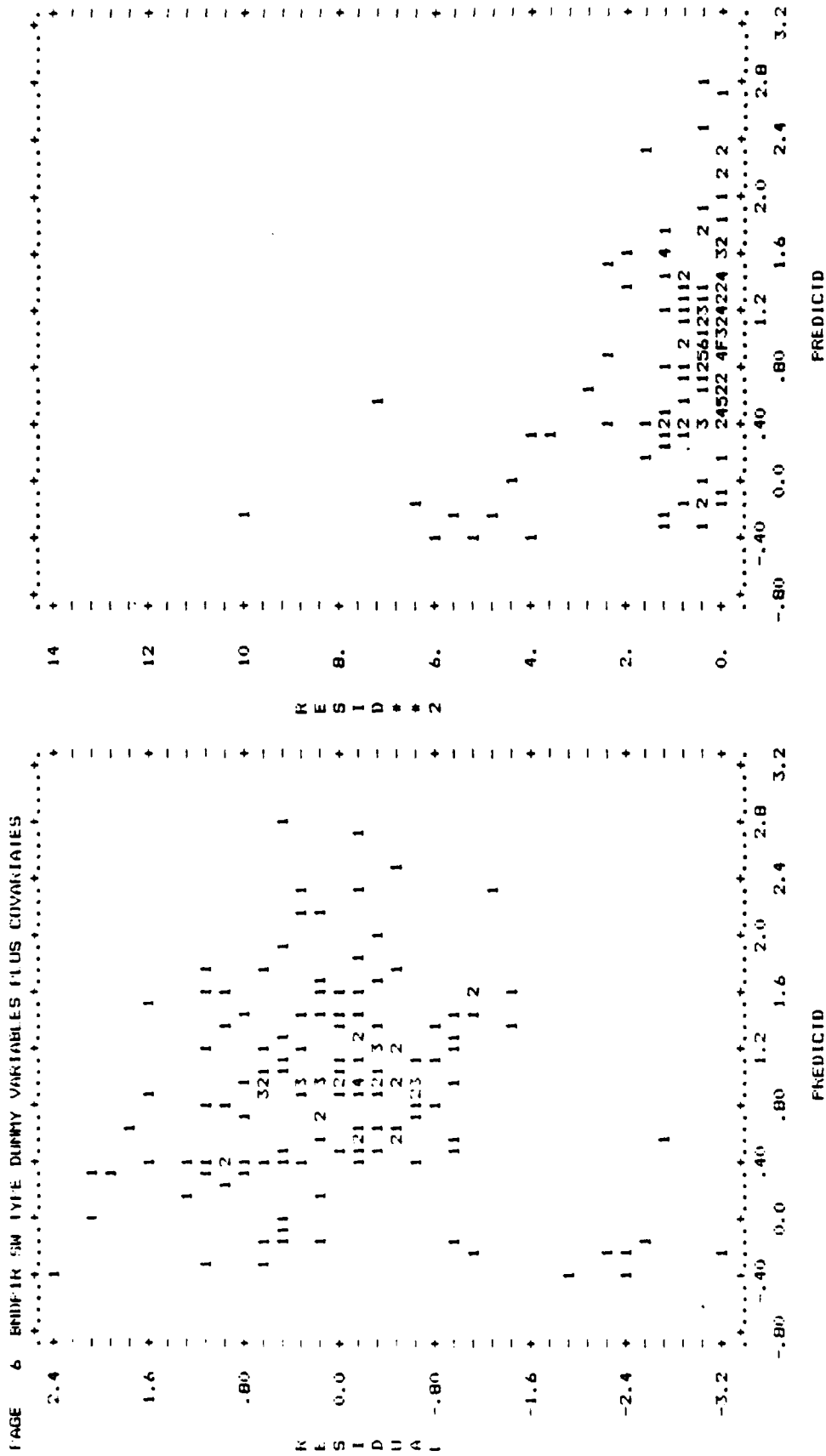
Figure C-8. Evaluation Report B7 (Continued)

Figure C-8. Evaluation Report B7 (Continued)

Figure C-8. Evaluation Report B7 (Concluded)

D. Structure of RAMSS Programs

APPENDIX D

STRUCTURE HIERARCHY OF RAMSS PROGRAMS

D.1 OVERALL RAMSS SYSTEM HIERARCHY.

a. At its highest level, the RAMSS System is controlled by four
DOS batch files located in the root directory of the RAMSS hard disk.
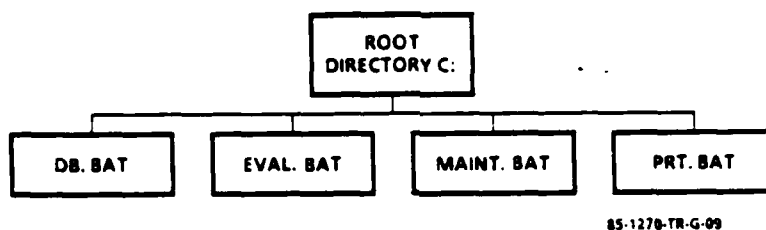This "high-level" hierarchy is shown in figure D-1.

85-1270-TR-G-09

Figure D-1. Overall RAMSS System Hierarchy

b. Following, is a one-line abstract of the purpose of each of
these batch routines:

DB.BAT   Loads dBASE III to allow for dBASE III RAMSS Processing
EVAL.BAT   Invokes BMDP programs to analyze evaluation data
MAINT.BAT   Invokes BMDP programs to analyze maintenance release data
PRT.BAT   Prints output files resulting from EVAL.BAT and MAINT.DAT

D.2 dBASE III RAMSS PROGRAMS HIERARCHY.

a. The dBASE III program modules which control the display
screens, computation of evaluation scores, update of various data
bases, generation of dBASE III analysis reports, and the construction
of ASCII data files for input into BMDP statistical analysis programs
are presented in figure D-2 in the form of a hierarchical diagram.
Figure D-3 presents a more detailed look at the hierarchical organi-
zation of the dBASE III modules.
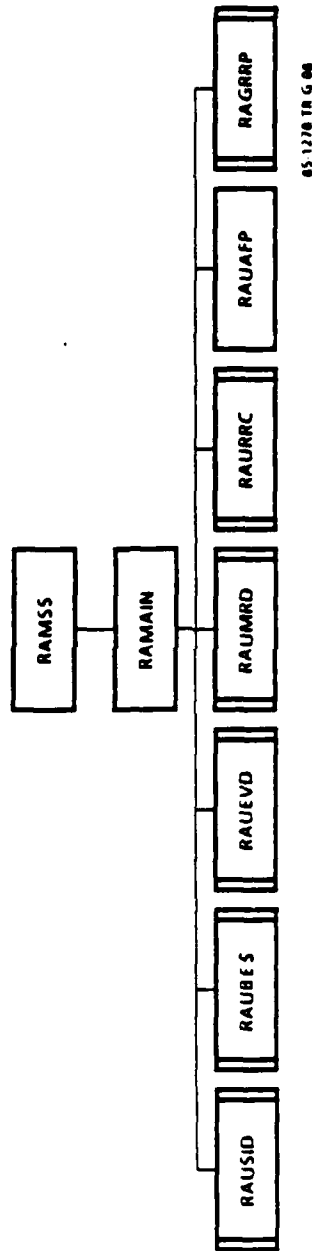
Figure D-2. dBASE III RAMSS Programs Hierarchy

```
RAMSS
RAMAIN

    1)  RAUSID                                 4)  RAUMRD
            RAUSIDC                                     RAUMRDC
            RAUSIDD                                         RAUMRDGT
            RAUSIDM                                         RAUMRDRP
                                                        RAUMRDD
    2)  RAUBES                                         RAUMRDM
            RAUBESC                                         RAUMRDGT
                RAUBESGT                                    RAUMRDRP
                RAUBESW
                    RAUBESWS                        5)  RAURRC
                    RAUBESWP                                RAURRCV
                    RAUBESWA                                RAURRCP
                RAUBESDP
                RAUBESRP                            6)  RAUAFP
                RAUBESCA
                    RAFACRGP                        7)  RAGRRP
                    RAESTRSK                                RAGRRPA
            RAUBESD                                             RAGRRPA1
            RAUBESM                                             RAGRRPA2
                RAUBESGT                                            RAA2CAL1
                RAUBESW                                             RAA2CAL2
                    RAUBESWS                                    RAGRRPA3
                    RAUBESWP                                        RAA3CAL1
                    RAUBESWA                                        RAA3CAL2
                RAUBESDP                                        RAGRRPA4
                RAUBESRP                                            RAA4CALC
                RAUBESCA                                        RAGRRPA5
                    RAFACRGP                                        RAA5CALC
                    RAESTRSK                                    RAGRRPA6
                                                            RAGRRPD
    3)  RAUEVD                                                 RAGRRPD1
            RAUEVDW                                            RAGRRPD2
                RAUEVDWM                                       RAGRRPD3
                RAUEVDU                                        RAGRRPD4
                    RAUEVDE1                                   RAGRRPD5
                    RAUEVDE2                               RAGRRPB
                        RAFACRGR                               RAGRRPBE
                    RAUEVDR1                                   RAGRRPBM
                    RAUEVDR2
                    RAUEVDR3
                        RAFACRGR
            RAUEVDD
            RAUSLCU
                RAUSLCUI
                RAUSLCUF
            RAUSLCD
```

Figure D-3.   dBASE III Logical Program Organization

dBASE III RAMSS PROGRAM ABSTRACTS

RAMSS	Start Up Program
RAMAIN	Program Driver
RAUSID	Update System Information Data Menu
RAUSIDC	Create New System Information
RAUSIDD	Delete System Information
RAUSIDM	Modify System Information
RAUBES	Update User/Supporter Baseline Estimate Menu
RAUBESC	Create New User/Supporter Baseline Estimate
RAUBESD	Delete User/Supporter Baseline Estimate
RAUBESM	Modify User/Supporter Baseline Estimate
RAUBESGT	Get Input from User
RAUBESW	Select Which Baseline Block Profile Method will be Used
RAUBESWS	Select Block Profile from Maintenance Data Entry
RAUBESWA	Select Block Profile from an Average of Maintenance Data
RAUBESWP	Select Block Profile from Previous Baseline Estimate
RAUBESRP	Replace New Values
RAUBESDP	Display Baseline Estimate
RAUBESCA	Calculate Available PMPC, Estimated PMPC, and Estimated Risk for all Blocks
RAUEVD	Update Evaluation Data Menu
RAUEVDW	Select which Evaluation Data Base is to be Updated
RAUEVDU	RAMSS Evaluation Data Update (RAEVAL)
RAUEVDR1	Replace Lower Level Fields
RAUEVDR2	Replace High Level Fields
RAUEVDR3	Replace High Level Fields (continued)
RAUEVDE1	Experiment with "what-if" Analysis (Does not Replace Values in File)
RAUEVDE2	Experiment with "what-if" Analysis (Continued)
RAUEVDD	Delete Evaluation Data (RAEVAL)
RAUSLCU	Software Life Cycle Process Update (RASLCP)

dBASE III RAMSS PROGRAM ABSTRACTS (Continued)

RAUSLCUI	Input Software Life Cycle Process Data
RAUSLCUF	Update Files
RAUSLCD	Delete Software Life Cycle Process Data (RASLCP)
RAUMRD	Update Maintenance Release Date Menu
RAUMRDC	Create New Maintenance Release Record
RAUMRDD	Delete Maintenance Release Record
RAUMRDM	Modify Maintenance Release Record
RAUMRDGT	Get Input Values From User
RAUMRDRP	Replace New Values
RAURRC	Update Risk Regression Equation Coefficients Menu
RAURRCV	Update Evaluated Risk Regression Equation Coefficients
RAURRCP	Update Estimated Person-Months per Change Coefficients
RAUAFP	Update AFOTEC Specific Parameters
RAGRRP	Generate RAMSS Reports Menu
RAGRRPA	Generate Risk Assessment Evaluation Analysis Reports Menu
RAGRRPA1	Evaluation Report A1: User/Supporter Baseline Estimate
RAGRRPA2	Evaluation Report A2: Table of Evaluation Scores
RAA2CAL1	Calculations for Evaluation Report A2
RAA2CAL2	Calculations for Evaluation Report A2 (Continued)
RAGRRPA3	Evaluation Report A3 Major Factor Percentile Chart
RAA3CAL1	Calculations for Evaluation Report A3 (For all Systems)
RAA3CAL2	Calculations for Evaluation Report A3 (For Same Type Systems)
RAGRRPA4	Evaluation Report A4 Major Factor Risk Reduction Potential
RAA4CALC	Calculations for Evaluation Report A4
RAGRRPA5	Evaluation Report A5 Plot of Available PMPC Versus Estimated Risk
RAA5CALC	Calculations for Evaluation Report A5

dBASE III RAMSS PROGRAM ABSTRACTS (Concluded)

RAGRRPA6	Evaluation Report A6 Risk Assessment Summary
RAGRRPD	Generate Data Base/File Reports Menu
RAGRRPD1	Evaluation Report D1: Table of Evaluation Data
RAGRRPD2	Evaluation Report D2: Table of Maintenance Release Data
RAGRRPD3	Evaluation Report D3: Table of Evaluated Risk Regression Data
RAGRRPD4	Evaluation Report D4: Table of Estimated PMPC Regression Data
RAGRRPD5	Evaluation Report D5: Table of AFOTEC Parameters
RAGRRPB	Build ASCII Files for BMDP Reports Menu
RAGRRPBE	Build ASCII File of Evaluation Data
RAGRRPBM	Build ASCII File of Maintenance Release Data

Frequently called procedures:

RALISTEM	List System Name and Software System Name for all System IDs
RALSTRLS	List all Release IDs for Selected System
RAFACRGR	Factor Regression Equation to Calculate Evaluated Risk
RAFACRGP	Factor Regression Equation to Calculate Estimated PMPC
RAESTRSK	Calculate Estimated Risk
RAPLOTIT	Plot Line from Beginning Value to End Point
RAPLTCND	Plot End Point of Value
RARATEIT	Rate Risk as being high, medium, or low

D.3 BMDP RAMSS PROGRAM HIERARCHY

a. The BMDP control files, which instruct BMDP programs, are invoked from the DOS batch files EVAL.BAT and MAINT.BAT. The hierarchy of the BMDP RAMSS programs is shown in figure D-4:
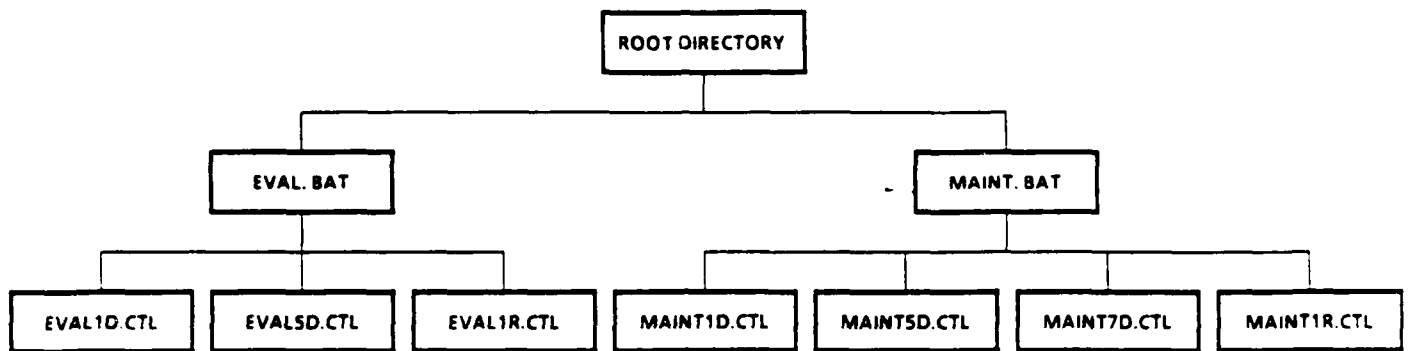
85-1270-TR-G-12

Figure D-4. BMDP Program Hierarchy

b. The following is a one-line abstract describing the purpose of each of the seven BMDP control files:

EVAL1D.CTL   Reads ASCII evaluation data file and computes simple descriptive statistics

EVAL5D.CTL   Produces histograms and plots of supportability factors and risk

EVAL1R.CTL   Performs regression analysis of evaluation data

MAINT1D.CTL   Reads ASCII maintenance release data file and computes simple descriptive statistics

MAINT5D.CTL   Produces maintenance profiles

MAINT7D.CTL   Plots maintenance profiles for all software types

MAINT1R.CTL   Performs regression analysis of maintenance release data

E. Data Base/ File Structures

APPENDIX E

DATA BASE/FILE STRUCTURES

E.1 INTRODUCTION.

a. The RAMSS data base/file structures are described in this appendix. The following data bases are described:

b. RAMSS data bases:

    (1) RASYSI.DBF

    (2) RAUSBE.DBF

    (3) RAEVAL.DBF

    (4) RASLCP.DBF

    (5) RARLSE DBF

c. RAMSS memory files:

    (1) RAAFTH.MEM

    (2) RAMFCO.MEM

    (3) RAPMCO.MEM

E.2   RASYSI.DBF - SYSTEM INFORMATION DATA BASE.

(1)   Record length = 78 bytes

(2)   Associated index files:

        RASYSIID.NDX
        RASYSISS.NDX

(3)   General Information:
      This data base contains basic information about each
      software system. Before any information can be entered
      into the four other data bases that make up the RAMSS
      system, that system must have an entry in the RASYSI data
      base.

(4)   Special Notes:
      Each record in the RASYSI data base has four flags that
      keep track of whether or not the system has associated
      data in the four other data bases. These flags are set
      to .F. when a new record is added to RASYSI. As associ-
      ated data are added, the flags are updated appropriately.

DATABASE FIELD DESCRIPTIONS

```
 # FIELD NAME FLD FIELD DESCRIPTION
             TYP WIDTH


 1 SWSYSID    N     3.0 Software system id number
 2 CRDATE     D     8.0 Creation date
 3 SYSTEM     C    20.0 Name of system in which software is imbedded
 4 SWSYSTEM   C    20.0 Name of software system
 5 SWTYPE     C     3.0 Type of software system (OFP,C-E,ATD,ATE,etc.)
 6 USER       C    10.0 Using command
 7 SUPPORTER  C    10.0 Supporting command  . .
 8 BSLNFLAG   L     1.0 Indicates if system has baseline info (T=yes)
 9 EVALFLAG   L     1.0 Indicates if system has evaluation info (T=yes)
10 SLCSFLAG   L     1.0 Indicates if sys. has S/W life cycle info (T=yes)
11 MAINFLAG   L     1.0 Indicates if system has maintenance info (T=yes)
```

Figure E-1. RASYSI.DBF Variable Descriptions

E.3 RAUSBE.DBF - USER/SUPPORTER BASELINE ESTIMATE DATA BASE

    (1) Record length - 203 bytes

    (2) Associated index files
        RAUSBEID.NDX

    (3) General Information:
        This data base contains the User/Supporter Baseline Esti-
        mates that summarize the general resources and level of
        support activity required to maintain each subject soft-
        ware system.

        This data base has a field, SWSYSID, also contained in
        the RASYSI data base. This allows it to be linked to the
        RASYSI data base whenever necessary.

    (4) Special Notes:
        Before a record for a software system can be added to the
        RAUSBE data base, there must already be an entry for that
        system in the RASYSI data base.

DATABASE FIELD DESCRIPTIONS

#	FIELD NAME	FLD TYP	FIELD WIDTH	DESCRIPTION
1	SWSYSID	N	3.0	Software system id number
2	UPDDATE	D	8.0	Update date
3	RLSDURTN	N	5.2	Release duration (in months)
4	RLSOVRLP	N	5.2	Release overlap (in months)
5	NSUPP1	N	3.0	Number of support personnel (group 1)
6	PSUPP1	N	3.0	% of support personnel ded.to system (group 1)
7	AVGSKILL1	N	4.2	Average skill of personnel (group 1)
8	NSUPP2	N	3.0	Number of support personnel (group 2)
9	PSUPP2	N	3.0	% of support personnel ded. to system (group 2)
10	AVGSKILL2	N	4.2	Average skill of personnel (group 2)
11	NTOTAL1	N	4.0	Total number of changes for block 1
12	NT_CORR1	N	4.0	Number of changes of type CORRection for block 1
13	NT_ENH1	N	4.0	Number of changes of type ENHancement block1
14	NT_CONV1	N	4.0	Number of changes of type CONVersion for block 1
15	NC_LOW1	N	4.0	Number of changes of complexity LOW for block 1
16	NC_MED1	N	4.0	Number of changes of complexity MEDium for block 1
17	NC_HIGH1	N	4.0	Number of changes of complexity HIGH for block 1
18	NP_NORM1	N	4.0	Number of changes of priority NORMal for block 1
19	NP_URG1	N	4.0	Number of changes of priority URGent for block 1
20	NP_EMER1	N	4.0	Number of changes of priority EMERgency to block 1
21	ESTRISK1	N	4.2	Estimated risk for block 1)
22	PMPCA1	N	5.2	Person-months per change (available) for block 1
23	PMPCE1	N	5.2	Person-months per change (estimated) for block 1
24	NTOTAL2	N	4.0	Total number of changes to block 2
25	NT_CORR2	N	4.0	Number of changes of type CORRection for block 2
26	NT_ENH2	N	4.0	Number of changes of type ENHancement for block 2
27	NT_CONV2	N	4.0	Number of changes of type CONVersion to block 2
28	NC_LOW2	N	4.0	Number of changes of complexity LOW for block 2
29	NC_MED2	N	4.0	Number of changes of complexity MEDium for block 2
30	NC_HIGH2	N	4.0	Number of changes of complexity HIGH for block 2
31	NP_NORM2	N	4.0	Number of changes of priority NORMal to block 2
32	NP_URG2	N	4.0	Number of changes of priority URGent to block 2
33	NP_EMER2	N	4.0	Number of changes of priority EMERgency to block 2
34	ESTRISK2	N	4.2	Estimated risk for block 2)
35	PMPCA2	N	5.2	Person-months per change (available) for block 2
36	PMPCE2	N	5.2	Person-months per change (estimated) for block 2
37	NTOTAL3	N	4.0	Total number of changes for block 3
38	NT_CORR3	N	4.0	Number of changes of type CORRection for block 3
39	NT_ENH3	N	4.0	Number of changes of type ENHancement for block 3
40	NT_CONV3	N	4.0	Number of changes of type CONVersion for block 3
41	NC_LOW3	N	4.0	Number of changes of complexity LOW to block 3
42	NC_MED3	N	4.0	Number of changes of complexity MEDium for block 3
43	NC_HIGH3	N	4.0	Number of changes of complexity HIGH to block 3
44	NP_NORM3	N	4.0	Number of changes of priority NORMal for block 3
45	NP_URG3	N	4.0	Number of changes of priority URGent to block 3
46	NP_EMER3	N	4.0	Number of changes of priority EMERgency to block 3
47	ESTRISK3	N	4.2	Estimated risk for block 3
48	PMPCA3	N	5.2	Person-months per change (available) for block 3
49	PMPCE3	N	5.2	Person-months per change (estimated) for block 3

Figure E-2. RAUSBE.DBF Variable Descriptions

E.4   RAEVAL.DBF - RAMSS EVALUATION DATA BASE.

(1)   Record length: 201 bytes

(2)   Associated index files:
      RAEVALID.NDX

(3)   General Information:
      This data base contains software supportability evalua-
      tion scores for each system. Low level evaluation scores
      in the range 1.00-6.00 are entered. for seven different
      categories. The higher level scores are then calculated
      from the low level scores.

      Field #1, SWSYSID, is also contained in RASYSI which
      allows it to be linked to RASYSI whenever necessary.

(4)   Special Notes:
      Before a record for a software system can be added to
      RAEVAL, there must already be an entry for that system in
      the RASYSI data base.

FIELD NAME FLD FIELD DESCRIPTION
            TYP WIDTH

#	FIELD NAME	FLD TYP	FIELD WIDTH	DESCRIPTION
1	SWSYSID	N	3.0	Software system id number
2	UPDDATE	D	8.0	Update date
3	USEFLAG	L	1.0	Indicates if eval. data is to be used in analysis
4	APDOC	N	4.2	Documentation rating (avg. of flds 5-10)
5	APDOCMOD	N	4.2	Modularity documentation rating
6	APDOCDES	N	4.2	Descriptiveness documentation rating
7	APDOCCON	N	4.2	Consistency documentation rating
8	APDOCSIM	N	4.2	Simplicity documentation rating
9	APDOCEXP	N	4.2	Expandability documentation rating
10	APDOCINS	N	4.2	Instrumentation documentation rating
11	APSRC	N	4.2	Source code rating (avg. of flds 12-17)
12	APSRCMOD	N	4.2	Modularity source code rating
13	APSRCDES	N	4.2	Descriptiveness source code rating
14	APSRCCON	N	4.2	Consistency source code rating
15	APSRCSIM	N	4.2	Simplicity source code rating
16	APSRCEXP	N	4.2	Expandability source code rating
17	APSRCINS	N	4.2	Instrumentation source code rating
18	APRODUCT	N	4.2	S/W product maintainability rating(avg. of 4 & 11)
19	AEPER	N	4.2	S/W support personnel rating (avg. of flds 20-23)
20	AEPERMAN	N	4.2	Management software support personnel rating
21	AEPERTEC	N	4.2	Technical software support personnel rating
22	AEPERSUP	N	4.2	Support software support personnel rating
23	AEPERCON	N	4.2	Contract software support personnel rating
24	AESYS	N	4.2	S/W support systems rating (avg. of flds 25-30)
25	AESYSHOS	N	4.2	Host computer support systems rating
26	AESYSBEN	N	4.2	Software bench support systems rating
27	AESYSLAB	N	4.2	Laboratory integrated test support systems rating
28	AESYSOPE	N	4.2	Operational support systems rating
29	AESYSCMS	N	4.2	Configuration management support systems rating
30	AESYSOTH	N	4.2	Other support systems rating
31	AEFAC	N	4.2	S/W support facility rating (avg. of flds 32 & 33)
32	AEFACOFF	N	4.2	Office support facility rating
33	AEFACENV	N	4.2	System environment support facility rating
34	AENVIRON	N	4.2	S/W support environment rating (avg. of 19,24.31)
35	AMCON	N	4.2	S/W configuration mgt. rating (avg. of flds 36-39)
36	AMCONIDE	N	4.2	Identification configuration mgt. rating
37	AMCONSTA	N	4.2	Status accounting configuration mgt. rating
38	AMCONCON	N	4.2	Control configuration mgt. rating
39	AMCONAUD	N	4.2	Audit configuration mgt. rating
40	AMMAI	N	4.2	S/W maintenance mgt. rating (avg. of flds 41-46)
41	AMMAIPLA	N	4.2	Planning of maintenance mgt. rating
42	AMMAIORG	N	4.2	Organization of maintenance rating
43	AMMAIDES	N	4.2	Design methods used in maintenance rating
44	AMMAICOD	N	4.2	Coding methods used in maintenance rating
45	AMMAITES	N	4.2	Testing methods used in maintenance rating
46	AMMAIINT	N	4.2	Organizational interfaces for maintenance rating
47	AMANAGE	N	4.2	S/W life cycle support mgt. rating (avg. of 35 & 40)
48	ASUPPORT	N	4.2	S/W supportability rating(avg. of flds 18,34, & 47)
49	ACONFID	N	4.2	S/W supportability confidence value(eval estimate)
50	EVALRISK	N	4.2	Evalulated risk computed from regression equation
51	VERIFIED	L	1.0	Inicates if record has been verified (T=yes)

Figure E-3. RAEVAL.DBF Variable Descriptions

E.5 RASLCP.DBF - Software Life Cycle Process Evaluation Data Base.

(1) Record length: 451 bytes

(2) Associated index files:
RASLCPID.NDX

(3) General information
This data base contains low level characteristic scores for the software life cycle process evaluation categories. There are a maximum of 40 scores for each of the 10 categories.

Field #1, SWSYSID, is also contained in RASYSI and RAEVAL which allows it to be linked to either of these two data bases whenever necessary.

(4) Special notes:

a) Before a record for a software system can be entered into the RASLCP data base, there must already be an entry in the RASYSI data base and the RAEVAL data base.

b) The 40 low level scores for each of the 10 categories are stored as 40-character strings. There are two reasons why the scores are stored in this manner:

1. dBASE III has a restriction of 128 fields per record. If each score was stored as a separate field, the RASLCP data base would have to be divided into four separate data bases.

2. The compactness of the file makes it easier to work with. When printing reports, the 40-character string can be manipulated easily.

Page No.   1   RASLCP
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                          DATABASE FIELD DESCRIPTIONS

  * FIELD NAME FLD FIELD DESCRIPTION
                TYP WIDTH

  1 SWSYSID   N   3.0 Software system id
  2 UPDDATE   D   8.0 Update date
  3 AMCONIDE   N   4.2 Identification configuration management rating
  4 SCMID   C   40.0 Individual identification scores
  5 AMCONCON   N   4.2 Status accounting configuration mgmt rating
  6 SCMCC   C   40.0 Individual status accounting scores
  7 AMCONSTA   N   4.2 Control configuration management rating
  8 SCMSA   C   40.0 Individual control scores
  9 AMCONAUD   N   4.2 Audit configuration management rating
 10 SCMAR   C   40.0 Individual audit scores
 11 AMMAIPLA   N   4.2 Planning of software management rating
 12 SPMPL   C   40.0 Individual planning scores
 13 AMMAIORG   N   4.2 Organization of software management rating
 14 SPMOR   C   40.0 Individual orgainization scores
 15 AMMAIDES   N   4.2 Rating of design methods used in S/W management
 16 SPMDE   C   40.0 Individual design method scores
 17 AMMAICOD   N   4.2 Rating of coding methods used in S/W management
 18 SPMCO   C   40.0 Individual coding method scores
 19 AMMAITES   N   4.2 Rating of testing methods used in S/W management
 20 SPMTE   C   40.0 Individual testing method scores
 21 AMMAIINT   N   4.2 Rating of organizational interfaces used in S/W mg
 22 SPMIN   C   40.0 Individual organizational interface scores

Figure E-4. RASLCP.DBF Variable Descriptions

E.6 RARLSE - MAINTENANCE RELEASE DATA BASE.

(1) Record length: 163 bytes

(2) Associated index files:
RARLSEID.NDX
RARLSESR.NDX

(3) General Information:
This data base contains history information of actual
software releases. It can contain.one or more records
for each software system. Each record is identified by
the combination of SWSYSID and a release identification
ID (RLSID).

Field #1, SWSYSID, is also contained in the RASYSI data
base which allows it to be linked to RASYSI whenever
necessary.

(4) Special Notes:
Before a record can be added to the RARLSE data base,
there must already be an entry for that system in the
RASYSI data base.

DATABASE FIELD DESCRIPTIONS

```
# FIELD NAME FLD FIELD DESCRIPTION
            TYP WIDTH


 1 SWSYSID    N     3.0 Software system id number
 2 RLSID      C     6.0 Release identification number
 3 UPDDATE    D     8.0 Update date
 4 USEFLAG    L     1.0 Indicates if maintenance info is used in analysis
 5 KLINES     N     5.0 Number of K-lines of source code
 6 PCHILEV    N     3.0 Percent of source code in high-level language(s)
 7 LANG1      C    10.0 Name of primary language
 8 NPERCON    N     4.0 # of direct S/W support personnel (contractor)
 9 ASKILCON   N     4.2 Average skill level of personnel (contractor)
10 PDEDSCON   N     4.2 % of personnel dedicated to S/W sys. (contractor)
11 PDEDRCON   N     4.2 % of personnel time dedicated to release(contrctr)
12 NPERORG    N     4.0 # of direct S/W support personnel (organic)
13 ASKILORG   N     4.2 Average skill level of personnel (organic)
14 PDEDSORG   N     4.2 % of personnel dedicated to S/W sys. (organic)
15 PDEDRORG   N     4.2 % of personnel dedicated to release (organic)
16 NPERSONS   N     4.0 Total # of direct S/W support personnel
17 AVGSKILL   N     4.2 Average skill level of all personnel
18 PDEDSWSYS  N     4.2 % of all personnel dedicated to the S/W system
19 PDEDRLS    N     4.2 % of all personnel time dedicated to the release
20 RLSSTART   D     8.0 Release start date
21 RLSEND     D     8.0 Release end date
22 RLSFLD     D     8.0 Release fielded date
23 RLSECM     N     5.2 Release duration, in equivalent calender months
24 PMEFFORT   N     5.1 Available person-month effort for engineering rls
25 PACTUAL    N     5.1 Actual person-months spent on release
26 NTOTAL     N     4.0 Total number of changes in release
27 NT_CORR    N     4.0 Number of changes of Type CORRection
28 NT_ENH     N     4.0 Number of changes of Type ENHancement
29 NT_CONV    N     4.0 Number of changes of Type CONVersion
30 NC_LOW     N     4.0 Number of changes of Complexity LOW
31 NC_MED     N     4.0 Number of changes of Complexity MEDium
32 NC_HIGH    N     4.0 Number of changes of Complexity HIGH
33 NP_NORM    N     4.0 Number of changes of Priority NORMal
34 NP_URG     N     4.0 Number of changes of Priority URGent
35 NP_EMER    N     4.0 Number of changes of Priority EMERgency
```

Figure E-5. RARLSE.DBF Variable Descriptions

E.7   RAAFTH.MEM - AFOTEC SPECIFIC PARAMETERS MEMORY FILE.

        RAAFTH.MEM is a dBASE III memory file which contains the
threshold and goal values for evaluation metric boundaries and risk
metric boundaries.   The following memory variables are stored in
RAAFTH.MEM:

VARIABLE NAME	TYPE	DESCRIPTION
AFTHDATE	D	Date of last update to parameters
AFTH_GE	N	Evaluation score goal (no greater than 6)
AFTH_TE	N	Evaluation score - threshold (no less than 1)
AFTH_GR	N	Risk value goal (no less than 0)
AFTH_GE	N	Risk value threshold (no greater than 1)

E.8 RAMFCO.MEM - EVALUATED RISK REGRESSION COEFFICIENTS MEMORY FILE.

RAMFCO.MEM is a dBASE memory file which contains the evaluated risk regression coefficients and an intercept value to be used to calculate evaluated risk. The following memory variables are stored in RAMFCO.MEM:

VARIABLE NAME	TYPE	DESCRIPTION
MFCODATE	D	Date of last update to coefficients
MFCOFLAG	L	Flag that is .T. if the coefficients are valid
MFCO1	N	Factor 1 coefficient (AMANAGE)
MFCO2	N	Factor 2 coefficient (APRODUCT)
MFCD3	N	Factor 3 coefficient (AEPER)
MFCO4	N	Factor 4 coefficient (AESYS)
MFCO5	N	Factor 5 coefficient (AEFAC)
MFCOCON	N	Intercept value (constant term)

E.9 RAPMCO.MEM - ESTIMATED PERSON-MONTHS PER CHANGE REGRESSION
     COEFFICIENTS MEMORY FILE.

RAPMCO.MEM is a dBASE III memory file which contains the estimated person-months per change regression coefficients and an intercept value to be used to calculate estimated person-months per change. The following memory variables are stored in RAPMCO.MEM:

VARIABLE NAME	TYPE	DESCRIPTION
PMCODATE	D	Date of last update to coefficients
PMCOFLAG	L	Flag that is .T. if the coefficients are valid
PMCO1	N	Factor 1 coefficient (AVGSKILL)
PMCO2	N	Factor 2 coefficient (PTCORR)
PMCO3	N	Factor 3 coefficient (PCLOW)
PMCO4	N	Factor 4 coefficient (PCHIGH)
PMCO5	N	Factor 5 coefficient (PPNORM)
PMCOATD	N	Software type ATD coefficient
PMCOATE	N	Software type ATE coefficient
PMCDCE	N	Software type C-E coefficient
PMCOEW	N	Software type EW coefficient
PMCOOFP	N	Software type OFP coefficient
PMCOCON	N	Intercept value (constant term)
PMCOSD	N	Standard deviation

F. Glossary

APPENDIX F

GLOSSARY OF TERMS

F.1 INTRODUCTION.

a. The glossary of terms for the RAMSS has varied as the
methodology development has progressed. Refer to BDM/A-84-322-TR
(Final) dated September 28, 1984, for a complete glossary of terms
relating to risk assessment.

b. Some terms have more than one description; when this is the
case, the description either:

(1) Are significantly different between sources (though the
effective meaning may be not much different)

(2) Are used differently (different users or technical
language)

(3) May be found within the context of a different source

(4) Have real differences in meaning.

Both DoD and non-DoD (e.g., FIPS PUBs, NBS Special Publications)
sources are used. The non-DoD sources and terms are not mandated for
our use, but are rather included for breadth of understanding, for
those relevant terms commonly used with the non-DoD governmental
and/or private sectors.

c. The source of each description is indicated by a symbol in
parentheses before that source's term description:

TERM$_1$

   (SYMBOL$_{1.1}$)

   Description$_{1.1}$...

   (SYMBOL$_{1.2}$)

   Description$_{1.2}$...

   .

   .

   .

   (SYMBOL$_{1.n}$)

   Description$_{1.n}$...

TERM$_2$

   .

   .

   .

TERM$_N$

The symbols used and corresponding sources are:

(AFOTECP1)   AFOTECP 800-2, Volume I, 10 Nov 82, "Software Test Manager's Guide."

(AFOTECP3)   AFOTECP 800-2, Volume III, 1 Jan 84, "Software Maintainability Evaluator's Guide."

(AFOTECP5)   AFOTEC 800-2, Volume V, 25 Jul 83, "Software Support Facility Evaluation--User's Guide."

(AFR55-43)   Air Force Regulation 55-43, "Management of Operational Test and Evaluation", 28 Jun 1985.

(AFR800-14)   Air Force Regulation 800-14, Volume I, "Management of Computer Resources in Systems," 12 Sep 75.

(DoD480A)   DoD Standard 480A, "Configuration Control - Engineering Changes, Deviations and Waivers", 12 Apr 78.

(ROWE)   Rowe, William, An Anatomy of Risk, John Wiley, 1977.

(CURRENT)   Current document definition.

F.2 GLOSSARY OF TERMS FOR DEVELOPING AND IMPLEMENTING A RISK
     ASSESSMENT METHODOLOGY FOR SOFTWARE SUPPORTABILITY.

Allocated Baseline

> (DoD480A)
> See Baseline.

Allocated Configuration Identification

> (DoD480A)
> Current, approved performance oriented specifications governing
> the development of configuration items that are part of a higher
> level CI, in which each specification (1) defines the functional
> characteristics that are allocated from those of the higher level
> CI, (2) establishes the tests required to demonstrate achievement
> of its allocated functional characteristics, (3) delineates neces-
> sary interface requirements with other associated configuration
> items, and (4) establishes design constraints, if any, such as
> component standardization, use of inventory items, and integrated
> logistic support requirements.

Application Software

> (AFOTECP5)
> The software written by software support personnel, or purchased
> from a contractor, used directly in supporting ECSs. It is
> normally used for simulation, testing, and ECS code development.

Automated Software Development Tool

> (AFOTECP5)
> A component of System Software that assists in the design, imple-
> mentation, documentation, and verification of ECS software.

Availability

> (AFR800-14)
> A measure of the degree to which an item is in the operable and
> commitable state at the start of the mission, when the mission is
> called for at an unknown (random) point in time. (MIL-STD-721)
>
> (AFOTECP5)
> The probability that a system is operating satisfactorily at any
> point in time when used under stated conditions.

Available Person Time (APT)

> (CURRENT)
> The software support person-months available for a particular
> software release computed as the product of the release duration

in months, the number of support personnel, and the percentage of the time those personnel are dedicated to the subject software release (versus shared across other releases or other software systems). This time includes overhead activity directly related to the subject release. The release duration is the release engineering completion date minus the release start date.

Baseline

(DoD480A)
A configuration identification document or a set of such documents formally designated and fixed at a specific time during a CI's life cycle. Baselines, plus approved changes from those baselines, constitute the current configuration identification. For configuration management there are three baselines, as follows:

   a)   Functional Baseline. The initial approved functional configuration identification.

   b)   Allocated Baseline. The initial approved allocated configuration identification.

   c)   Product Baseline. The initial approved or conditionally approved product configuration identification.

(ROWE)
A known reference used as a guide for further development activities.

Baseline Profile

(CURRENT)
See Baseline Software Change Profile.

Baseline Software Change Profile

(CURRENT)
The set of numbers (or any subset) determined by specifying the number of requests per release for each request category. A request category is the triple (type, priority, complexity) where type is conversion, enhancement, or correction; priority is emergency, urgent, or normal; and complexity is high, medium, low.

Baseline Software Supportability Estimate

(CURRENT)
See User/Supporter Baseline Estimate

Block Release

(CURRENT)
See Release.

Change Control

> (DoD480A)
> See Configuration Control

Complexity of MA

> (CURRENT)
> See Maintenance Complexity

Computer Program

> (AFR800-14)
> A series of instructions or statements in a form acceptable to an
> electronic computer, designed to cause the computer to execute an
> operation or operations.

Computer Program Configuration Item (CPCI)

> (CURRENT)
> See Computer Software Configuration Item

Computer Resources

> (CURRENT)
> The totality of computer hardware, computer software, personnel,
> documentation, supplies, and services.

> (AFR800-14)
> The totality of computer equipment, computer programs, associated
> documentation, contractual services, personnel and supplies.

Computer Resources Integrated Support Plan (CRISP)

> (AFR55-33)
> The CRISP identifies organizational relationships and responsi-
> bilities for the management and technical support of computer
> resources. It functions during the full-scale development (FSD)
> phase to identify computer resources necessary to support computer
> programs after program management responsibility and system turn-
> over are transferred. After the transfer, the CRISP continues to
> function as the basic agreement between the supporting and using
> commands for management and support of computer resources.

Computer Resources Working Group (CRWG)

> (CURRENT)
> A group comprised of all the participating commands (for a
> particular system) which writes and updates the Computer Resources
> Integrated Support Plan (CRISP). The group insures that necessary
> elements of the CRISP are included in transfer and turnover
> agreements.

Computer Software Configuration Item (CSCI)

(CURRENT)
See Configuration Item

Configuration Audit

(CURRENT)
The process of verifying that all required configuration items have been produced, that the current version agrees with specified requirements, that the technical documentation completely and accurately describes the configuration items, and that all change requests have been resolved.

Configuration Control

(DoD480A)
The systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of a configuration item after formal establishment of its configuration identification.

Configuration Identification

(DoD480A)
The current approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings and associated lists, and documents referenced therein.

Configuration Index

(CURRENT)
This document, produced by the development contractor, reports the current status of configuration item development in terms of specifications and other documents that depend on the configuration, such as qualification Test Plans and Procedures, User Manuals, and the Version Description Document. It lists all ECPs and SCNs incorporated, approved ECPs not yet incorporated, and other data.

Configuration Item (CI)

(AFR800-14)
An aggregation of equipment/software, or any of its discrete portions, which satisfies an end use function and is designated by the Government for configuration management. CIs may vary widely in complexity, size and type, from an aircraft or electronic system to a test meter or round of ammunition. During development and initial production, CIs are only those specification items that are referenced directly in a contract (or an equivalent in-house agreement). During the operation and maintenance period,

any repairable item designated for separate procurement is a configuration item (AFR 65-3).

Configuration Management (CM)

(DoD480A)
A discipline applying technical and administrative direction and surveillance to (1) identify and document the functional and physical characteristics of a configuration item, (2) control changes to those characteristics, and (3) record and report change processing and implementation status.

Configuration Management Plan (CMP)

(CURRENT)
A document which describes project responsibilities and procedures for implementing CM.

Configuration Management System (CMS)

(AFOTECP5)
A system applying technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a configuration item; to control changes to those characteristics and to record and report change processing and implementation status.

Configuration Status Accounting

(DoD480A)
The recording and reporting of the information that is needed to manage a configuration effectively, including a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

Consistency

(CURRENT)
A measure of the extent the software products correlate and contain uniform notation, terminology, and symbology.

Conversion (Adaptive) MA

(CURRENT)
See Maintenance Type.

Corrective MA

(CURRENT)
See Maintenance Type.

Critical Issues

(AFOTECP1)
Those aspects of a system's capability, either operational, tech-
nical, or other, that must be questioned before a system's overall
worth can be estimated and that are of primary importance to the
decision authority in reaching a decision to allow the system to
advance into the next acquisition phase (DoD Directive 5000.3).

Data Item Description

(AFR800-14)
A form which specifies an item of data required to be furnished by
a contractor. This form specifically defines the content, prepa-
ration instructions, format and intended use of each data product.

Descriptiveness

(CURRENT)
A measure of the extent that software products contain information
regarding its objectives, assumptions, inputs, processing, out-
puts, components, revision status, etc.

Development Contractor Activity

(CURRENT)
Those organizations responsible for development of a system in
order to achieve an initial operational capability. Organizations
include the prime development contractor and any subcontractors to
the prime contractor.

Documentation

(AFOTECP5)
All of the written work describing operating and maintenance
procedures for a system.

Embedded Computer Resources

(AFOTECP1)
Computer resources incorporated as integral parts of, dedicated
to, required for direct support of, or for the upgrading or modi-
fication of major or less than major system(s) (excludes ADP
resources as defined and administered under AFR 300 series)
(USAF/RD/LE Policy letter, 13 October 1981).

Embedded Computer System (ECS)

(AFOTECP1)
a) A computer that is integral to an electromechanical system and
   that has the following key attributes:

(1) Physically incorporated into a large system whose primary function is not data processing

(2) Integral to, or supportive of, a larger system from a design, procurement, and operations viewpoint

(3) Inputs include target data, environmental data, command and control, etc.

(4) Outputs include target information, flight information, control signals, etc.

b) In general, an embedded computer system (ECS) is developed, acquired, and operated under decentralized management (DoD Directives 5000.1, 5000.2).

Emergency MA

(CURRENT)
See Maintenance Priority.

Engineering Change Proposal (ECP)

(AFR55-43)
A formal, priced document (DD Form 1692) used to propose changes to the contact provisions and scope, if not partially waived (see Contract Change Proposal), and to the configuration item baseline identification especially when related equipment, critical issues, interfaces, or technical manuals are affected or retrofit is involved. See MIL-STDs 480, 481, and 483; and AFR 400-3.

Enhancement (Perfective) MA

(CURRENT)
See Maintenance Type.

Estimated Person Months Per Change

(CURRENT)
See Person Months Per Change

Estimated Risk

(CURRENT)
See Software Supportability Risk

Estimation

(ROWE)
The assignment of probability measures to a postulated future event.

Evaluated Person Months Per Change

> (CURRENT)
> See Person Months Per Change

Evaluated Risk

> (CURRENT)
> See Software Supportability Risk.

Evaluation

> (ROWE)
> Comparison of an activity performance with the objectives of the
> activity and assignment of a success measure to that performance.

Evaluation Criteria

> (AFOTECP1)
> Standards by which achievement of required operational effective-
> ness/suitability characteristics or resolution of technical or
> operational issues may be judged. For full-scale development and
> beyond, evaluation criteria must include quantitative goals (the
> desired value) and thresholds (the value beyond which the charac-
> teristic is unsatisfactory) whenever possible (DoD Directive
> 5000.3).

Expandability

> (CURRENT)
> A measure of the extent that a physical change to information,
> computational functions, data storage, or execution time can be
> easily accomplished once the nature of what is to be changed is
> understood.

> (AFOTECP5)
> A measure of the ease with which the functional capability of
> computer hardware or software may be expanded.

Facility

> (AFOTECP5)
> The physical plant and the services it provides; specific examples
> are physical space, electrical power, physical and electromagnetic
> (TEMPEST) security, environmental control, fire safety provisions,
> and communications availability.

Firmware

(AFOTECP1)
a) Computer programs and data loaded in a class of memory that cannot be dynamically modified by the computer during processing.
b) Hardware that contains a computer program and data that cannot be changed in its application environment.

Note 1.   Computer programs and data contained in firmware are classified as software; the circuitry containing the computer program and data is classified as hardware (Data and Analysis Center for Software).

Functional Baseline

(DoD480A)
See Baseline.

Functional Configuration Audit (FCA)

(DoD480A)
The formal examination of functional characteristics test data for a configuration item, prior to acceptance, to verify that the item has achieved the performance specified in its functional or allocated configuration identification.

Functional Configuration Identification

(DoD480A)
The current approved technical documentation for a configuration item which prescribes (1) all necessary functional characteristics, (2) the tests required to demonstrate achievement of specified functional characteristics, (3) the necessary interface characteristics with associated CI's, (4) the CI's key functional characteristics and its key lower level CI's, if any, and (5) design constraints, such as envelope dimensions, component standardization, use of inventory items, integrated logistics support policies.

High Complexity MA

(CURRENT)
See Maintenance Complexity.

Historical Maintenance Profile

(CURRENT)
A histogram of data on software system releases, with the x-axis representing discrete ranges of (available) person-months per change and the y-axis representing the number of software system

releases that fall into each x-axis discrete range. For purposes
of analysis or illustration, the axes may be reversed.

Independent Verification and Validation (IV&V)

(AFOTECP1)
An independent assessment process structured to ensure that
computer programs fulfill the requirements stated in system and
subsystem specifications and satisfactorily perform the functions
required to meet the user's and supporter's requirements. IV&V
consists of three essential elements: independent, verification,
and validation:

  (1) Independent. An organization/agency which is separate from
       the software development activity from a contractual and
       organizational standpoint.

  (2) Verification.   The evaluation to determine whether the
       products of each step of the computer program development
       process fulfill all requirements levied by the previous
       step.

  (3) Validation.   The integration, testing, and/or evaluation
       activities carried out at the system/subsystem level to
       evaluate the developed computer program against the system
       specifications and the user's and supporter's requirements
       (AFR 88-14).

Initial Operational Capability (IOC)

(CURRENT)
That point in a system's life cycle when the agreed upon number of
production systems has been delivered to the user (using command)
for operational use.

Instrumentation

(CURRENT)
A measure of the extent that software products contain aids that
enhance testing.

Interface Control Working Group (ICWG)

(MIL-STD-483)
For programs which encompass a system/HWCI/CSCI design cycle, an
ICWG normally is established to control interface activity between
contractors or agencies, including resolution of interface
problems and documentation of interface agreements.

Interoperability

(AFOTECP5)
A measure of the degree to which computer hardware/software can interface to and operate with other similar computer hardware/ software.

Low Complexity MA

(CURRENT)
See Maintenance Complexity.

Maintainability

(AFOTECP5)
The probability that a system out of service for maintenance can be properly repaired and returned to service in a stated elapsed time.

Maintenance Complexity

(CURRENT)
The general degree of difficulty to complete a maintenance request: high, medium, low.

High: An MA where changes are in requirements, design, code, and test; or greater than 10 percent of CSCI is affected; or several modules are affected by the change (global changes); or the technical nature of the change requires highly specialized personnel skills; or the level of effort by personnel is large.

Medium: An MA where changes are in design, code and test; or between 1 percent and 10 percent of CSCI is affected; or at least two modules are affected by the change (semi-local); or the level of effort by personnel is average.

Low: An MA where changes are isolated to only one unit (e.g., one module/compilation unit) of code; or no more than 1 percent of CSCI is affected; or the level of effort by personnel is minimal.

Maintenance Documentation

(AFOTECP5)
The documentation that describes the maintenance of computer system hardware and software.

Maintenance Priority

(CURRENT)
The criticality of the maintenance request in order to preserve mission readiness; emergency, urgent, normal.

Emergency; An MA requiring all available personnel's dedicated effort to correct the problem as soon as possible (e.g., 24 hours); MIL-STD-1679 severity code 1 or 2: mission termination or severe degradation.

Urgent: An MA requiring next "block release" turnaround; MIL-STD-1679 severity code 3: mission impact.

Normal: An MA not in the Emergency or Urgent categories; MIL-STD-1679 severity code 4 or 5: mission inconvenience.

Maintenance Profile

(CURRENT)
See Historical Maintenance Profile.

Maintenance Request Category

(CURRENT)
The identification of a maintenance request by specification of the maintenance priority, type, and complexity.

Maintenance Type

(CURRENT)
The type of maintenance actions required to complete a maintenance request: conversion, enhancement, correction.

Conversion (Adaptive) MA: Any change/effort to a software system which is initiated as a result of changes in the environment (e.g., hardware, system software) in which the software system must operate.

Enhancement (Perfective) MA: Any change, insertion, deletion, modification, or extension made to a software system to meet the evolving needs of the user.

Corrective MA: Any change which is necessitated by actual faults (induced or residual) in a software system.

Medium Complexity MA

(CURRENT)
See Maintenance Complexity.

Modularity

(CURRENT)
A measure of the extent that a logical partitioning of software products into parts, components, and/or modules has occurred.

Normal MA

(CURRENT)
See Maintenance Priority.

Operation Support Activity

(CURRENT)
Those organizations responsiole for post deployment operation and
support of a system. Organizations include the using command,
supporting command, contractors (if used), and test and evaluation
agencies (if used).

Operational Effectiveness

(AFOTECP1)
The overall degree of mission accomplishment of a system used by
representative personnel in the context of the organization,
doctrine, tactics, threat (including countermeasures and nuclear
threats), and environment in the planned operational employment of
the system (DoD Directive 5000.3).

Operational Suitability

(AFOTECP1)
The degree to which a system can be satisfactorily placed in field
use, with consideration being given to availability, compatibil-
ity, transportability, interoperability, reliability, wartime
usage rates, maintainability, safety, human factors, manpower
supportability, logistic supportability, and training requirements
(DoD Directive 5000.3).

Person-Months per Change (PMPC)

(CURRENT)
Available PMPC: Raw personnel resources workload to support a
user/supporter baseline workload estimate of a specified number of
changes. Computed as the number of full-time equivalent personnel
times the release cycle in months divided by the total number of
changes.

Estimated PMPC: An estimate of a personnel resources workload
required to support the user/supporter baseline estimate. This
estimate is computed by using a regression equation whose
coefficients are derived from historical maintenance release data.

Evaluated PMPC: A realistic estimate of personnel resources work-
load effectiveness to support the user/supporter baseline estimate
as derived from an evaluation of the software supportability char-
acteristics.

Personnel

> (CURRENT)
> See Support Personnel.

Personnel Skill Level

> (CURRENT)
> A subjective integer rating from 1 (lowest) to 5 (highest) of
> software support personnel experience, education, and specific
> task responsibility capabilities.

Physical Configuration Audit (PCA)

> (DoD480A)
> The formal examination of the "as-built" configuration of a unit
> of a CI against its technical documentation in order to establish
> the CI's initial product configuration identification.

Priority

> (CURRENT)
> See Maintenance Priority.

Probability

> (ROWE)
> A numerical property attached to an activity or event whereby the
> likelihood of its future occurrence is expressed or clarified.

Probability Distribution

> (ROWE)
> The representation of a repeatable stochastic process by a
> function satisfying the axioms of probability theory.

Probability of Occurrence

> (ROWE)
> The probability that a particular event will occur, or will occur
> in a given interval.

Procurement Activity

> (CURRENT)
> Those government organizations responsible for assuring delivery
> of a production system. Organizations include the program office,
> implementing command, development and operational test and evalua-
> tion agencies, and appropriate independent verification and
> validation agencies if used.

Product Baseline

(DoD480A)
See Baseline.

Product Configuration Identification

(DoD480A)
The current approved or conditionally approved technical documen-
tation which defines the configuration of a CI during the
production, operation, maintenance, and logistics support phases
of its life cycle, and which prescribes (1) all necessary physical
or form, fit and function characteristics of a CI, (2) the
selected functional characteristics designated for production
acceptance testing, and (3) the production acceptance tests.

Program Management Directive (PMD)

(AFR800-14)
The official HQ USAF management directive used to provide
direction to the implementing and participating commands and
satisfy documentation requirements. It will be used during the
entire acquisition cycle to state requirements and request studies
as well as initiate, approve, change, transition, modify or ter-
minate programs. The content of the PMD, including the required
HQ USAF review and approval actions, is tailored to the needs of
each individual program (AFR 800-2).

Program Management Plan (PMP)

(AFR800-14)
The document developed and issued by the Program Manager which
shows the integrated time-phased tasks and resources required to
complete the task specified in the PMD. The PMP is tailored to
the needs of each individual program (AFR 800-2).

Program Management Responsibility Transfer (PMRT)

(AFR800-14)
That point in time when the designated Supporting Command accepts
program management responsibilities from the Implementing Command.
This includes logistic support and related engineering and pro-
curement responsibilities (AFR 800-4).

Program Support Tools

(AFOTECP3)
General debug aids, test/retest software, trace software/hardware
features, use of compiler/link editor, library management/con-
figuration management/text editor/display software tools.

Program Test Plan

(AFOTECP3)
Set of descriptions and procedures for how the program is to be
(or can be, or has been) tested.

Quality Assurance (QA)

(CURRENT)
All actions that are taken to assure that a development organiza-
tion delivers products that meet performance requirements and
adhere to standards and procedures.

Release

(CURRENT)
A version of a software system representing either the initial
baseline configuration or an update to a previous version that
incorporates a defined set of software change requests. Each
release becomes a new baseline configuration.

Release Engineering Completion Data

(CURRENT)
The date when the software engineering activity for a release is
complete. The software engineering activity includes configura-
tion management, quality assurance, and software maintenance
project phases of requirements, design, code, unit test, integra-
tion test, and operational test. Activity including "kit
proofing," prom burning, and in general technical order modifica-
tions which typically occur between engineering completion and
field implementation (distribution) is not included.

Release Field Date

(CURRENT)
The date when a software system release is officially distributed
and implemented in the field for operational use.

Release ID

(CURRENT)
A unique identifier for a software system release.

Release Start Date

(CURRENT)
The date when major analysis activity related to a specified
release begins for which software support resources are required.

Reliability

> (ROWE)
> The probability that the system will perform its required functions under given conditions for a specified operating time.

Risk

> (ROWE)
> The potential for realization of unwanted, negative consequences of an event.

Risk Acceptance

> (ROWE)
> Willingness of an individual, group, or society to accept a specific level of risk to obtain some gain or benefit.

Risk Acceptance Function

> (ROWE)
> A subjective operator relating the levels of probability of occurrence and value of a consequence to a level of risk acceptance.

Risk Acceptance Level

> (ROWE)
> The acceptable probability of occurrence of a specific consequence value to a given risk agent.

Risk Acceptance Utility Function

> (ROWE)
> The profile of the acceptability of the probability of occurrence for all consequences involved in a risk situation for a specific risk agent.

Risk Agent

> (ROWE)
> A person or group of persons who evaluates directly the consequences of a risk to which the person or group of persons is subjected.

Risk Assessment

> (ROWE)
> The total process of quantifying a risk and finding an acceptable level of that risk for an individual, group, or society. It involves both risk determination and risk evaluation.

Risk Assessment Methodology for Software Supportability (RAMSS)

(CURRENT)
A method of determining the disparity between the estimated risk (determined from the support concept, baseline software supportability profile, and historical maintenance profile) and the evaluated risk (determined from a conversion of the software supportability evaluation metrics).

Risk Consequence

(ROWE)
The impact to a risk agent of exposure to a risky event.

Risk Determination

(ROWE)
The process of identifying and estimating the magnitude of risk.

Risk Estimation

(ROWE)
The process of quantification of the probabilities and consequence values for an identified risk.

Risk Evaluation

(ROWE)
The complex process of developing acceptable levels of risk to individuals or society.

Risk Profile Baseline

(CURRENT)
The measure of information and/or requirements which serve as the zero reference against which negative (and positive) outcomes can be determined.

Risk Reduction

(ROWE)
The action of lowering the probability of occurrence and/or the value of a risk consequence, thereby reducing the magnitude of the risk.

Sensitivity Analysis

(ROWE)
A method used to examine the operation of a system by measuring the deviation of its nominal behavior due to perturbations in the performance of its components from their nominal values.

Simplicity

(CURRENT)
A measure of the extent that software products reflect the use of singularity concepts and fundamental structures in organization, language, and implementation techniques.

Simulation

(AFR800-14)
The representation of physical systems or phenomena by computers, models or other equipment.

Site

(CURRENT)
A software support site, or particular location, where software support activity is being accomplished. Includes sites such as the Air Logistics Centers (ALCs).

Site Survey Form

(CURRENT)
The data collection form used during the software support site visits to collect background, evaluation, and maintenance release data.

Software

(AFOTECP1)
A set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system.

(CURRENT)
The programs which execute in a computer. The data input, output, and controls upon which program execution depends and the documentation which describes, in a textual medium, development and maintenance of the program.

Software Change Request

(CURRENT)
An official request that could involve a change to a software system. Such requests include problem report, enhancement requirement, modification request, or any other form that is officially tracked by a configuration management function.

Software Configuration Management

(CURRENT)
A discipline applying technical and administrative direction and surveillance to 1) identify and document the functional and

physical characteristics of a configuration item, 2) control changes to those characteristics, and 3) record and report change processing and implementation status.

Software Delivery

(CURRENT)
That point in the software life cycle when the software support function assumes responsioility for the "next" set of configuration changes to the software (e.g., next block release). This point is logically no later than PMRT, but could be as early as IOC. This applies when a contractor or government agency assumes the software support function.

Software Error

(CURRENT)
The human decision (inadvertent or by design) which results in the inclusion of a fault in a software product.

Software Fault

(CURRENT)
The presence or absence of that part of a software product which can result in software failure.

Software Life Cycle Process

(CURRENT)
The policy, methodology, procedures, and guidelines applied in a software environment to the software development and support life cycle activities.

Software Maintainability

(AFOTECP1)
The ease with which software can be changed in order to:
    (1) Correct errors
    (2) Add/modify system capabilities through software changes
    (3) Delete features from programs
    (4) Modify software to be compatible with hardware changes.

(CURRENT)
A quality of software which reflects the effort required to perform software maintenance actions.

Software Maintenance

(CURRENT)
Those actions required for:
- (1) Correction - Removal, correction of software faults
- (2) Enhancement - Addition/deletion of features from the software
- (3) Conversion - Modification of the software because of environment (data hardware) changes.

Software Maintenance Environment

(CURRENT)
An integration of personnel support systems and physical facilities for the purpose of maintaining software products.

Software Maintenance Measures

(CURRENT)
Measures of software maintainability and environment capabilities to support software maintenance activity.

Software Maintenance Project Management

(CURRENT)
The software life cycle process management applied during the support phase for the software to accomplish specific software maintenance tasks which derive from software problem reports or change requests.

Software Management

(CURRENT)
The policy, methodology, procedures, and guidelines applied in a software environment to the software development/maintenance activities. Also, those personnel with software management responsibilities.

Software Project Management

(CURRENT)
See Software Management.

Software Project Management Design Methods

(CURRENT)
The software project management process utilizes design methods which enhance software supportability to the extent that design methodology standards and conventions are: 1) documented, followed, and validated through quality assurance, 2) can be transitioned to support activity, and 3) produce adequate design specifications which reflect supportability characteristics.

Software Project Management Implementation Methods

(CURRENT)
The software project management process utilizes implementation methods which enhance software supportability to the extent that implementation/coding/testing methodology, standards, and conventions are: 1) documented, followed, and validated through quality assurance, 2) can be transitioned to the support activity, and 3) produce supportable production products.

Software Project Management Organization Structure

(CURRENT)
The software project management process organization structure enhances software supportability to the extent that the physical structure, functional responsibilities, external interfaces and assigned personnel provide for continuity over the software life cycle phases, and have proper interfaces with organizations responsible for software support.

Software Project Management Planning

(CURRENT)
The software project management process utilizes planning which enhances software supportability to the extent that plans for the development, test, product transfer, operation and support exist, have been implemented, have been appropriately coordinated across activities, and satisfy contractual and/or regulation requirements.

Software Project Management Project Interfaces

(CURRENT)
The software project management possesses organization interfaces which enhance software supportability to the extent that external project organization relationships and responsibilities are: 1) defined, 2) provide a valuable functional role, and 3) contribute to systematic cost effective procurement, development, operation and support processes.

Software Project Management Test Strategies

(CURRENT)
The software project management process utilizes test strategies which enhance software supportability to the extent that the test plans, descriptions, procedures, and results have been: 1) documented, 2) can be transitioned to the support activity, and 3) provide for a consistent and systematic process for verifying and validating that software requirements have been satisfied.

Software Reliability

(CURRENT)
A quality of software which reflects the probability of failure
free operation of a software component or system in a specified
environment for a specified item.

Software Portability

(CURRENT)
A quality of software which reflects the effort required to
transfer the software from one environment (hardware and system
software) to another.

Software Support Concept

(CURRENT)
The estimated support personnel resources, level of dedication and
expertise of the support personnel, and the duration of the block
release cycle.

Software Support Facility (SSF)

(AFOTECP5)
The facility which houses and provides services for the support
systems and personnel required to maintain the software for a
specific ECS.

Software Support Personnel

(CURRENT)
See Support Personnel.

Software Support Resources

(CURRENT)
The totality of personnel, systems, physical facilities, and
calendar time that are used/consumed during a software support
release effort.

Software Supportability

(CURRENT)
A measure of the adequacy of personnel, resources, and procedures
to facilitate:
(1) Modifying and installing software
(2) Establishing an operational software baseline
(3) Meeting user requirements.

Software Supportability Evaluation

(CURRENT)
An evaluation to derive a measure of how well a software system
can be supported. (See Software Supportability.)

Software Supportability Evaluation Metrics

(CURRENT)
The closed-form questionnaire scores for each software support-
ability characteristic in a software supportability evaluation as
well as the values computed by cumulating lower level scores.

Software Supportability Magnitude of Risk Consequence

(CURRENT)
The level of impact to a software user or supporter as a result of
the risk level of a software supportability negative outcome.

Software Supportability Negative Outcome

(CURRENT)
Any outcome for which the software support resources are not
adequate to accomplish required software support.

Software Supportability Risk

(CURRENT)
The probability at a given point during the software support phase
that the software maintenance activity specified by a baseline
software supportability profile cannot be accomplished with the
available software support resources.

Estimated Software Supportability Risk: An estimate of the soft-
ware supportability risk determined by the area under a normal
distribution curve. The area is the part under the curve greater
than the subject software's available person-months per change
value as computed from the software support concept and baseline
software change profile. The normal distribution curve is deter-
mined by using the estimated person months per change as the mean
and the standard deviation from the derivation of the estimated
person months per change regression equation.

Acceptable Software Supportability Risk: The estimated software
supportability risk which is agreed upon by the user (using
command) and supporter (supporting command) as a result of the
baseline software supportability agreement.

Evaluated Software Supportability Risk: An approximation to the
software supportability risk computed from the software support-
ability evaluation metrics. The computation is derived from a

linear regression model using the software life cycle process,
software product, support personnel, support systems, and support
facility as the five regression equation factors.

Measured Software Supportability Risk: See Evaluated Software
Supportability Risk.

Software System

(CURRENT)
A set of software (specifications, programs, and data) which
constitutes a well-defined major function or group of functions.

Typical systems include avionics OFP, ground based communications,
missile guidance, simulation, threat generator, ATE, and electro-
nic warfare.

Software System Type

(CURRENT)
One of seven classifications of a software system's primary
functional mission: ATD, ATE, C-E, EW, OFP, SIM, SUP.

ATD: Aircrew Training Device or Operational Flight Trainer for
training and support of an operational system, usually in the form
of a mockup simulator.

ATE: Automatic Test Equipment software to support the testing of
hardware units under test (UUT), create and maintain the environ-
ment where the test software may be used, or prepare/analyze/main-
tain test software.

C-E: Communications-Electronics software for command and control,
communications, surveillance and warning, air traffic control,
intelligence, and other related functions.

EW: Electronic Warfare software that involves the use of electro-
magnetic energy and performs functions either separate or integral
to a larger airborne or ground system.

OFP: Operational Flight Program software/firmware that is
integral to an onboard aircraft computer system including naviga-
tion, flight control, fire control, weapon delivery, electronic
engine control, and heads-up display.

SIM: Simulation Software not included as part of the ATD,
including simulation models.

SUP: Support Software including application support software and
system support software not included in any other category.

Specification Change Notice (SCN)

(CURRENT)
The SCN is used to distribute approved page changes to authorized
users of baseline documents who, in turn, are responsible for
posting the updates.

Source Code

(CURRENT)
The form of the program code in its source language.

Standards

AFOTECP3)
Procedures, rules, and conventions used for prescribing
disciplined program design and implementation.

Support Concept

(CURRENT)
The software support concept usually specified as part of the
CRISP and OS/CMP. Also includes that part of the support concept
necessary to establish the acceptable risk from a baseline soft-
ware change profile: standard release duration, number of support
personnel, average skill level, percentage of personnel dedicated
to releases, support facility, etc.

Support Facility

(CURRENT)
The physical facility resources that must be available for the
software support resources to accomplish a specific task(s).

Support Personnel

(CURRENT)
A general term for personnel (military, DoD civilian, or DoD con-
tractor) whose skills are necessary to directly support mission
critical system software maintenance. Includes but is not limited
to management, technical, non-technical support, and contractor
personnel.

Support System

(AFOTECP5)
Any automated system used to change, test, or manage the con-
figuration of ECS software and associated documentation. Includes
but is not limited to Host Processor, Software Bench, Laboratory-
Integrated Test Facility, Operational-Integrated Test Facility,
and Configuration Management System.

Support System Facility

(AFOTECP5)
The facility resources that must be available for the software
support resources to accomplish a specific task(s).

System Software

(AFOTECP5)
All of the software that is part of the software support facility
computer system. It is never or seldom accessed directly by soft-
ware support facility personnel; it controls the processing of
application software. It includes the Operating System, Source
Code Editor, Language Translator, Link Editor/Loader, Librarian/
File Manager, Data Base Manager, and Automated Software Develop-
ment Tool.

Test and Evaluation Master Plan (TEMP)

(AFR55-43)
An overall Test and Evaluation (T&E) plan designed to identify and
integrate the effort and schedules of all T&E to be done in an
acquisition program.

Threshold

(ROWE)
A discontinuous change of state of a parameter as its measure
increases. One condition exists below the discontinuity, and a
different one above it.

Time to Complete Maintenance Request (TC)

(CURRENT)
The calendar time from receipt of the maintenance request by the
support control group until the request has been accepted as part
of an operational system software configured release. (This does
not mean the configuration is released or distributed, and this
time does not include this additional delay, if any.)

Type

(CURRENT)
See Maintenance Type.

Uncertainty

(ROWE)
The absence of information; that which is unknown.

Urgent MA

(CURRENT)
See Maintenance Priority.

Verification/Validation (of computer programs)

(AFR800-14)
The process of determining that the computer program was developed
in accordance with the stated specification and satisfactorily
performs, in the mission environment, the function(s) for which it
was designed.

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